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		Size Pkgs	List Price	Physicians Price
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VITAMIN D	1 000 U S P units (activated ergosterol)	250	8 35	6.26
VITAMIN B ₁	200 Int'l units (500 gammas Thiamin Chloride)	500	15 75	11.81
VITAMIN B ₂ (G)	50 S B units (125 gammas Riboflavin)			
VITAMIN C	500 Int'l units (Ascorbic Acid 25 mg)			

Suggested uses PLURI VITAMINS are useful as a therapeutic agent in known or suspected cases of multiple avitaminoses to insure a highly desirable balanced vitamin intake For prophylaxis or treatment of any given deficiency

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VITAMIN B ₁	500 Int'l units (Thiamin Chloride 1 5 mg)	500	28 80	21.60
VITAMIN B ₂ (G)	100 S B units (250 gammas Riboflavin)			
VITAMIN C	500 Int'l units (Ascorbic Acid 25 mg.)			
NICOTINIC ACID	15 mg			

Suggested uses VICAP FORTIOR was designed to meet the requirements of pan vitamin therapy Its routine use is suggested in the convalescence from pneumonia and influenza and in the treatment of tuberculosis, diabetes mellitus, fevers, infections, deficiency diets, pre-operative preparation, post-operative convalescence or other conditions where the vitamin reserve is quickly diminished and there is an urgent need of augmented vitamin intake

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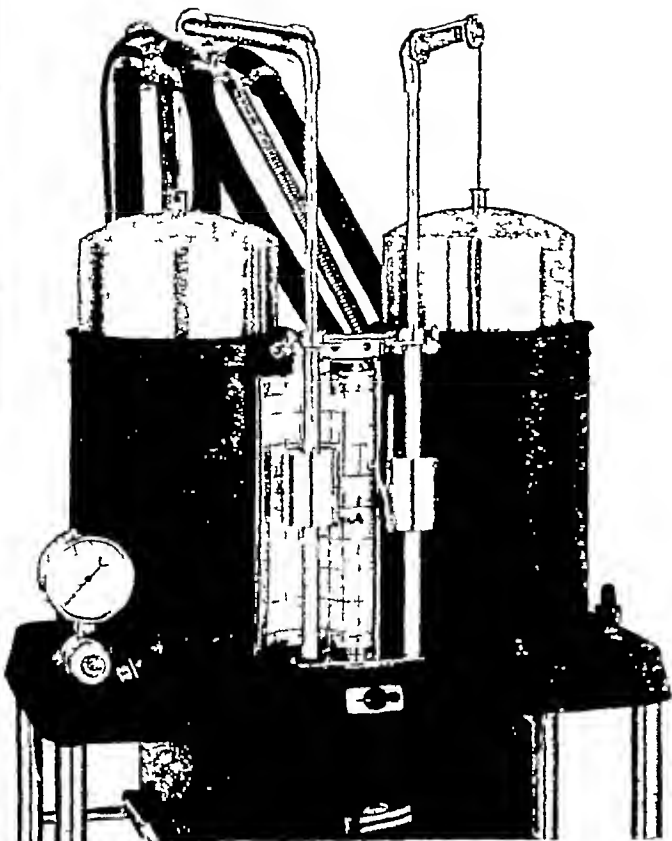
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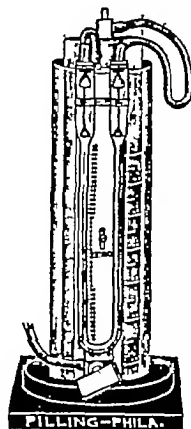
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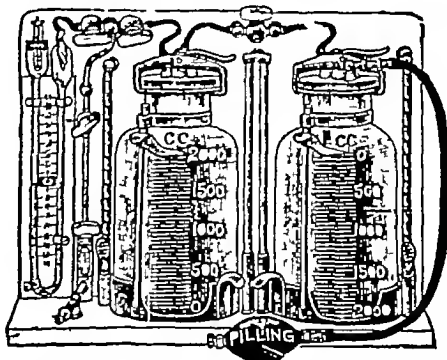
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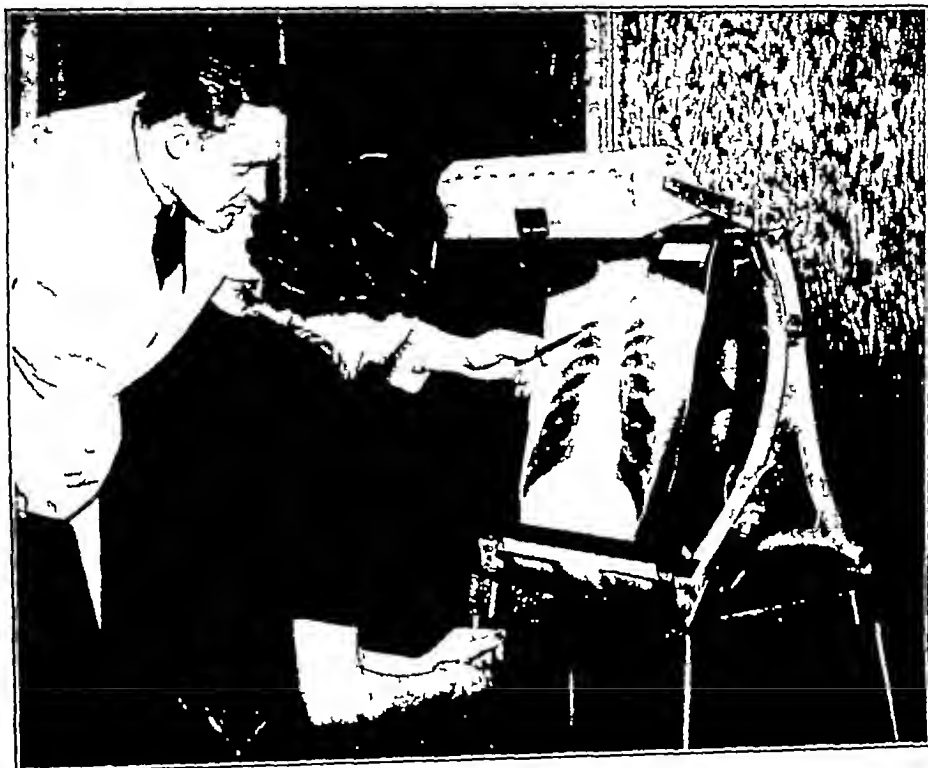
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Editorial Comment

OHIO AND WEST VIRGINIA STATES ISSUE

IN conformity with a policy which was started at the inception of this journal, one issue of

Diseases of the Chest, is devoted each year, to the presentation of a picture of sanatorium facilities, of the advances made in tuberculosis control in one state or in a group of states in this country

In 1935, the August issue of *Diseases of the Chest*, was dedicated to the State of New Mexico. In 1936, the May issue of *Diseases of the Chest*, was dedicated to the State of Missouri. In 1937, the June issue of *Diseases of the Chest*, was dedicated to the States of North Carolina, South Carolina, Virginia, Georgia, and Florida, and it was known as the *South Atlantic States Issue*. In 1938, the June issue of *Diseases of the Chest*, was dedicated to the States of California, Oregon, and Washington, and it was known as the *Pacific Coast States Issue*. In 1939, the October issue of *Diseases of the Chest*, was dedicated to the States of Illinois, Indiana, Iowa, and Wisconsin, and it was known as the *Mississippi Valley States Issue*.

This year, it is our privilege and pleasure to dedicate this Issue of *Diseases of the Chest*, to the States of Ohio and West Virginia, and the issue is to be known as the *Ohio and West Virginia States Issue*.

Each of the states represented in this issue of the journal has contributed scientific papers, dealing with subjects related to chest diseases, and written by physicians who are closely identified with the treatment of chest diseases in those states.

Each of these states has presented a picture through the printed word and by illustration, showing the present facilities for the treatment of the tuberculous within those states.

This issue of the Journal also carries the pictures and the biographies of physicians in the States of Ohio and West Virginia, who have pioneered in tuberculosis work in their respective states. We pay tribute to these pioneers of medicine, and only regret that we do not have the space available to include the biographies of many more of the eminent physicians who have been pioneers in this great cause.

The Editorial Board of *Diseases of the Chest*, expresses its appreciation to the State Committees under whose direction this issue of *Diseases of the Chest* was compiled, and also to the officials of sanatoria, tuberculosis societies, and to all of the other individuals and agencies that cooperated to make this issue of *Diseases of the Chest* possible.

—F W B

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LOUIS MARK, M.D.
1892 -

Dr Louis Mark was born at Duluth, Minnesota, December 12, 1892. He was graduated from the Ironwood Michigan High School and enrolled in the Marquette University, Milwaukee, Wisconsin, where he was graduated with a degree of Doctor of Medicine in 1915. He interned in the Cincinnati General Hospital for one year, and in the summer of 1916 assisted in research work at the University of Wisconsin with Dr Kennon Dunham and Dr William Snow Miller. He entered private practice in Washburn, Wisconsin, where he remained until the World War, and then went to Cincinnati where he was associated with Dr Kennon Dunham. During the War he was contract surgeon, doing chest examining for the Advisory Board. At the end of 1918

and the early part of 1919 he was resident physician at the Ohio State Sanatorium. On July 1, 1919 he purchased the Rocky Glenn Sanatorium for tuberculosis at McConnelsville, which he has conducted ever since. During these 21 years the institution has increased from a capacity of less than 20 beds to a capacity of 150 beds at present.

Following the World War he was chest expert for the Veteran's Bureau from 1919 to 1923. In 1921 he moved his office to Columbus, Ohio, where he has practiced since, and has limited his practice to diseases of the chest. He has been a leader in the medical development and the healing of tuberculosis throughout the state of Ohio, and has taken an active part in the establishment and the development of chest clinics throughout the state. He has written many articles on the problems of tuberculosis both in relation to diagnosis and treatment.

In 1928 he was appointed Chief of the Chest Department at White Cross Hospital, Columbus, Ohio. In 1934 he started the J M Case Tuberculosis Sanatorium at Delaware, Ohio, and has been its Medical Director since.

At the present time, he is Medical Director of the Rocky Glenn Sanatorium at McConnelsville, Ohio, Medical Director of the J M Case Tuberculosis Sanatorium at Delaware, Ohio, Chief of the Chest Department at White Cross Hospital, Columbus, Ohio, and Advisor of Tuberculosis Work to several labor organizations.

He was married in 1919, and has three children, Charlotte, age 20, and Louise and Lloyd, twins, age 16. He is a great believer in hobbies. He has played golf a great deal, and has been Club Champion for many years. He is also a very ardent bridge player, and is one of the Directors of the American Contract Bridge League. He loves to take moving pictures, takes his camera wherever he goes, and has a large collection of fine movies by which to remember all past experiences. He has been a fellow of the American College of Physicians since 1926, and was one of the charter members of the American College of Chest Physicians.

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A Brief Summary of the Tuberculosis Campaign in Ohio*

The Campaign against tuberculosis in Ohio begins officially with the publication by the State Board of Health of the popular educational circular entitled "The Prevention of Consumption" in 1894

In 1897, the board of health of the city of Cincinnati passed a regulation which declared tuberculosis a reportable disease This is the first official pronouncement on the subject in Ohio so far as can be ascertained The board of health went one step further when it set apart a building in its contagious disease hospital group for the care and treatment of cases of tuberculosis This was done on July 8, 1897 It was the first municipal hospital for the consumptive poor in the United States¹

The next year 1898, the State Board of Health sent instructions to the superintendents of public institutions concerning the disease and the offer of laboratory service in the examination of sputum This laboratory service has grown with the years and continues to be one of our important aids in diagnosis

On November 14, 1901 the Ohio Society for the Prevention of Tuberculosis was organized This Society followed the pattern of the Pennsylvania Society for the Prevention of Tuberculosis founded by Dr Flick in 1892 The Ohio Society was thus the second state organization established in the United States It was incorporated October 24, 1911 and reorganized as the Ohio Public Health Association on May 13, 1920

An act was passed by the General Assembly of Ohio on April 23, 1902 which provided for the appointment of a commission to investigate the feasibility of erecting sanatoria for tuberculosis patients in Ohio The results of this first step was the dedication of the Ohio State Sanatorium at Mt Vernon on October 27, 1909 Today, the institution has 258 beds available for cases of incipient pulmonary tuberculosis

The first tuberculosis dispensary in Ohio was opened by the Medical College of Western Reserve University, Cleveland, on October 6, 1904 The medical director was John H Lowman, M.D

In the meantime, the first local organization with a continuous record was organized, the Anti-

Tuberculosis League of Cleveland This took place on March 3, 1905 Today there are 88 county-wide associations covering every county in the state

On April 2, 1908 the General Assembly passed an act authorizing boards of County Commissioners to construct suitable buildings for the care of tuberculosis patients to be known as a county hospital for tuberculosis Under this act, Franklin County opened the first institution in the state on January 8, 1909 In 1909 the county law was amended to provide that from two to five counties could join in establishing a district for the erection and maintenance of a district tuberculosis hospital Today there are 16 county hospitals with a total bed capacity of 2,111, 3 district tuberculosis hospitals with total bed capacity of 369 5 private tuberculosis hospitals with a total bed capacity of 441, public institutions with separate provision for tuberculosis cases with total beds of 993 2 federal hospitals with total bed capacity of 250 and 1 state institution with provision for 257 beds, making the total bed capacity in Ohio 4387

The first state-wide vital statistics law was not enacted until May 5, 1908 Mortality statistics of tuberculosis began to assume validity in 1909 The death rate in that year was 143.7 per 100,000 population—the number of deaths being 6,844 In 1939 the record shows 2,946 deaths with a rate of 39.21 per 100,000 population

In 1910 the first state-wide Christmas Seal Sale was conducted to finance the Ohio Society for the Prevention of Tuberculosis As a result, the Society employed its first full-time paid executive secretary This method of finance has continued to the present day, having grown from a total of \$37,235.27 in the state to \$312,652.91 in 1939

The first survey of the tuberculosis situation in the state was made in 1911 and published by the Ohio State Board of Health in 1912 Employment of the first tuberculosis nurse occurred on March 4, 1912 by the Ohio Society for the Prevention of Tuberculosis This was the beginning of the present system of public health nurses in the state

At a meeting of the State Board of Health on August 15, 1912, tuberculosis was added to the list of reportable diseases

On May 15 1913, the first division of tuberculosis in a health department in the United States (Continued to page 376)

* Published by the Ohio Public Health Association, Columbus, Ohio, June 1926, pp 109

¹ A History of the National Tuberculosis Association, Knopf, 1922, p 11

Tuberculosis Pioneers in Ohio



JOHN H. LOWMAN, M.D.

1849 - 1919

In Cleveland and, to a large extent, in Ohio, the great public interest shown in the control of tuberculosis and the great efforts made by the medical profession and health agencies to establish this control are monuments to Dr John S Lowman

Almost single-handed he set in motion the influences and created the agencies and institutions that have pushed Cleveland to the forefront in the tuberculosis crusade Among his accomplishments were the founding of the Anti-Tuberculosis League of Cleveland and Cuyahoga County, the Ohio Public Health Association, first free diagnostic clinics, family prophylactic clinics, the adoption of legislation making tuberculosis a reportable disease in Cleveland, establishment of a bureau of tuberculosis in the Cleveland Division of Health, opening of Sunny Acres Sanatorium, and conducting the original tuberculosis educational campaign in Ohio

For 42 years Dr Lowman was a professor at the School of Medicine of Western Reserve University In 1877 he was named Professor of Materia Medica and Therapeutics, and in 1889 he was appointed Professor of Medicine In 1919 he relinquished the Professorship of Medicine and until his death the same year he occupied the chair of clinical medicine

It was in 1902 that Dr Lowman began to study the control of tuberculosis despite his labors in institutional medical education and an enormous private practice He visited the outstanding tuberculosis sanatoria and institutions of France and Germany Dr Lowman became a prominent figure at the international congresses on tuberculosis During 1913-14 he served as president of the National Tuberculosis Association

Dr Lowman found time among his crowded hours to lecture before labor unions, schools, church societies, settlements and other groups Endowed with a gracious personality and aided by a striking earnestness and speaking ability,

(Continued to page 379)



CHARLES OLIVER PROBST, M.D.

1857 - 1933

Delving into the origins of the fight against tuberculosis in Ohio, one is impressed with the perspicacity and pertinacity of Dr Charles Oliver Probst—the true pioneer in the movement in the state

Born December 4, 1857 in Middleport, Ohio, on the Ohio River, Dr Probst after attending local schools entered Miami Medical College, Cincinnati, on October 1, 1879 and graduated February 27, 1882, receiving his M D degree In July of that year he was appointed pharmacist at the State Hospital for the Insane at Athens In 1885 he moved to Columbus, Ohio where he opened an office for the practice of medicine

On July 28, 1886, he was elected secretary of the Ohio State Board of Health The law creating this new agency had just been passed by the General Assembly of Ohio in the preceding April In reality, Dr Probst was the first administrative head of the public health work in the state He was then 29 years of age

From his first appointment, until his resignation twenty-five years later, Dr Probst developed a wide interest in the many facets which go to make up the public health program of a state Not the least of these interests was an attack on tuberculosis—the outstanding leader in the causes of death not only in Ohio but the nation as well

Examination of the record reveals Dr Probst presenting a proposal to the State Board of Health as early as June 19, 1889, to issue a popular pamphlet on the prevention of pulmonary consumption Authority was given the president and secretary of the Board to prepare such a circular However, nothing was done at this time

Finally, in 1894, Dr Probst circularized the profession of the entire state to find out what the prevailing opinion was concerning the prevention of the disease The outcome of this query enabled him to report to the State Board of Health "These reports afford the most convincing evidence that

(Continued to page 376)

Tuberculosis Pioneers in Ohio



H. KENNON DUNHAM, M.D.
1872 -

Dr Dunham was born on March 3, 1872 in Fairview, Ohio. He received his M.D. degree from the University of Cincinnati in 1894 and then took post-graduate work at Johns Hopkins Hospital. He followed this with research work at the same place, demonstrating specific roentgen markings characteristic of pulmonary tuberculosis.

In 1904 he returned to the University of Cincinnati as Professor of Electro-therapeutics. In the course of time, Dr. Dunham assumed other positions at the University: Director of the Tuberculosis Clinic, Head of the Department of Tuberculosis, Associate Professor of Medicine, and Director of Tuberculosis Service for the Cincinnati General Hospital.

Dr. H. Kennon Dunham has been one of the early pioneers in demonstrating the value of x-ray findings in the diagnosis of tuberculosis. Many students came from various parts of the world to study under Dr. Dunham. He has contributed much to the medical literature and his writings have been widely circulated.

He is at present engaged in the private practice of chest diseases at Cincinnati.

Dr. Dunham is a past president of the Cincinnati Anti-Tuberculosis League, a past president of the Ohio Public Health Association, and a past president of the National Tuberculosis Association.



JOSEPH CHARLES PLACAK, M.D.
1882 -

Pioneer in tuberculosis work in the City of Cleveland is Dr. Joseph Charles Placak, who was born in Cleveland on February 22, 1882. He graduated from the College of Physicians and Surgeons of Western Reserve University in 1903 and did post-graduate work in the University of Prague, Austria.

He became resident pathologist of Cleveland City Hospital and later resident physician for a period of four years. In 1906, he was made the Medical Superintendent of the Municipal Tuberculosis Sanatorium for the city of Cleveland at Warrensville, Ohio, the first to hold this position. He has been head of the Division of Tuberculosis, Cleveland City Hospital since 1915. During the World War, he was a Major in the Medical Corps of the army and Chief of Medical Service, Evacuation Hospital No. 6, at Coblenz, Germany.

At present, Dr. Placak is a member of the American Board of Internal Medicine, American College of Physicians, Board of Directors of the National Tuberculosis Association, Member of the Board of Regents of the American College of Chest Physicians, President of the Anti-Tuberculosis League of Cleveland and Cuyahoga County, Chief of Staff of Mount Royal Sanatorium for Tuberculosis, Consulting Physician at Lake County Memorial Hospital. Dr. Placak has also written numerous articles on chest diseases and public health.

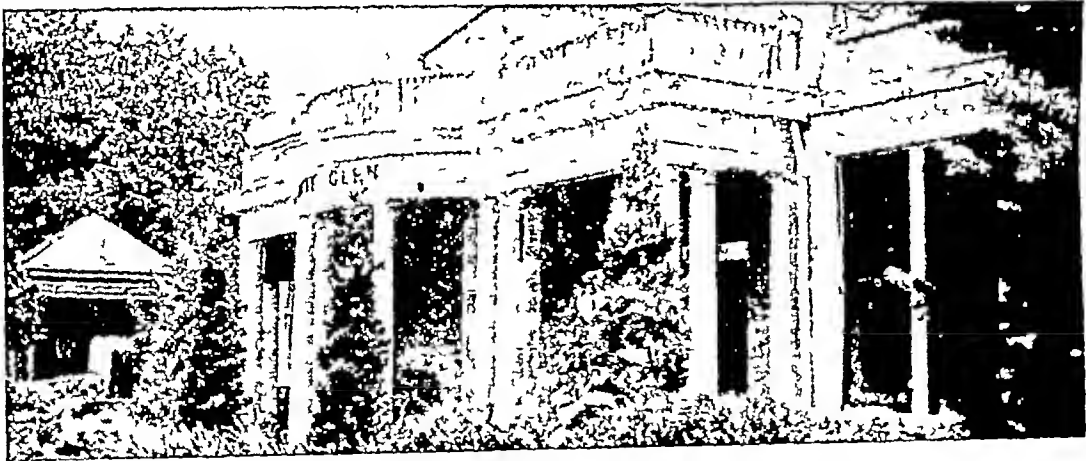
Tuberculosis Pioneers in Ohio



HARRY A. PHILLIPS
1886 - 1940

Ohio lost one of her most indefatigable workers in tuberculosis with the death of Harry A. Phillips on October 5, 1940. Harry Phillips entered the tuberculosis field in 1910, when he himself developed the disease and entered Mt. Vernon Sanatorium. As his health improved, he took a secretarial position in the office of the Superintendent, Dr. Douglass, which position led to active management of the entire institution, when Dr. Douglass was called to Italy for an International Tuberculosis Conference.

It was at Mt. Vernon that Harry Phillips met Dr. Louis Mark. Out of the warm friendship that flourished between the two men, came Harry Phillips' next forward step in tuberculosis work. For when Dr. Mark purchased Rocky Glen Sanatorium twenty years ago, Harry Phillips was installed as Manager. He held that position until his death. And the fruit of his twenty years of labor is embodied in the sanatorium, which rose from a small, unknown institution to one of the finest private sanatoria in the United States. Truly, Harry Phillips needs no memorial stone. Rocky Glen Sanatorium is a living monument to his energy, his business acumen, his passionate desire to build for the tuberculous sick a suitable haven, a place where men could be revived and sent back to the world once again whole. Rocky Glen is the phoenix, rising from the ashes of Harry Phillips' earlier weariness of body and spirit. For we, who knew him, Harry Phillips is not dead. We have only to look at Rocky Glen to know that he will live on this earth until the buildings crumble to dust.



ROCKY GLENN SANATORIUM

McCONNELSVILLE, OHIO

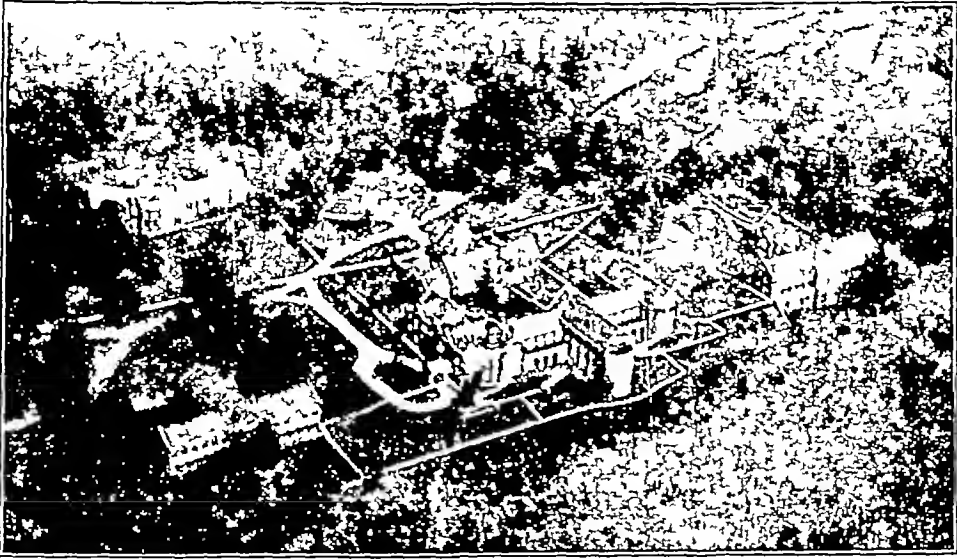
The Rocky Glenn Sanatorium was established by Dr. Clyde Leeper in 1911, as a private institution for the care of tuberculosis patients. In 1915, the institution was taken over by Dr. Hill, who continued to operate it until 1919. The capacity was very small and the institution was of the cottage-plan type. Dr. Louis Mark purchased the institution in 1919 and has continued to conduct it since that time and it has since been enlarged to 150 beds.

In 1921, Harry Phillips became superintendent and he remained in this capacity until his death on

October 5, 1940. It was through his untiring efforts that this institution was built to its present capacity.

The institution remains as a private institution of cottage-plan type, with all forms of tuberculosis being cared for. The institution is beautifully laid out and the grounds are very restful. Both medical and surgical facilities are available, and a complete operating setup for all types of tuberculosis is in the main building. The institution boasts of a very fine record and has operated to capacity through all of the years.

Ohio Sanatoria



OHIO STATE SANATORIUM MOUNT VERNON, OHIO

The Ohio State Board of Health of which Dr C O Probst was secretary organized in 1901 the Ohio Society for Prevention of Tuberculosis. About two years later Dr Probst requested the Governor of Ohio to appoint a Commission to investigate the advisability of providing a State Tuberculosis Sanatorium in Ohio. This became an act on April 23 1902. Dr Probst became secretary of that Commission. In April 1904 the general assembly passed an act to provide for the appointment of a committee to select and purchase lands and erect necessary buildings for the State Sanatorium confined to the care of incipient pulmonary tuberculosis. Dr Probst became secretary of this committee and most of the ultimate results in a medical way which needed foresight were sponsored

through the recommendations of Dr Probst.

The Ohio State Sanatorium was dedicated on October 27 1909, with a capacity of one hundred and twenty patients, built on the cottage-plan. The tract consists of three hundred and fifty-five acres of rolling land and a virgin forest located three miles northeast of Mt Vernon. Dr C B Conwell of Cincinnati Ohio was the first Superintendent who served until his ill-health demanded his resignation in 1911. He was succeeded by Dr Stephen A Douglas of Mansfield, Ohio who served until 1920 and was succeeded by Dr F C Anderson of Cambridge Ohio who is the present superintendent. The present capacity of the Sanatorium is two hundred and forty beds.



THE AVALON SANATORIUM MOUNT VERNON, OHIO

The Avalon Sanatorium located on the outskirts of Academia, about two miles from Mt Vernon, Ohio, was founded by C R Dotson in 1932, and rapidly developed from a private home to an Institution with facilities for caring for 105 bed cases of tuberculosis.

There are eight buildings for patients, with rooms very pleasantly located each with a three side exposure, giving a maximum of light, air and sunshine. There are also a nurses' dining room, help's dining room, an administration building, a newly equipped kitchen, a laundry and a pasteurizing plant.

The medical and surgical equipment is practical and up-to-date, and there are facilities for doing all necessary work, with a medical staff thoroughly ef-

ficient and capable of carrying out any work of this kind.

The Avalon Sanatorium is patronized by both county and private patients also the state tuberculosis patients from Fort Hayes. This Institution is known over the United States and patients have come from as far west as Utah.

Surroundings and treatment, which are like those of a private home, do much to keep the inmates cheerful and happy. This attitude of mind is a necessary asset in the cure of tuberculosis, and is the fundamental reason that nearly 75 per cent of the patients who enter Avalon are able to leave and resume their regular life.

Ohio Sanatoria



EUCLID-MENTOR SANATORIUM

MENTOR, OHIO

Established four years ago Euclid-Mentor Sanatorium has been a real home for tuberculosis patients, who gain rapidly in the pleasant and comfortable surroundings and where the most scientific and modern equipment is combined with excellent medical and nursing care.

The sanatorium is privately owned and is situated on U S Route No 20 23 miles from the center of Cleveland Ohio. There are thirty-five acres of land on which are vegetable gardens, orchards, flower gardens and spacious lawns. There is pure spring water and only the highest quality of food is served. Patient's appetite whims are favored so far as is consistent with sound medical treatment.

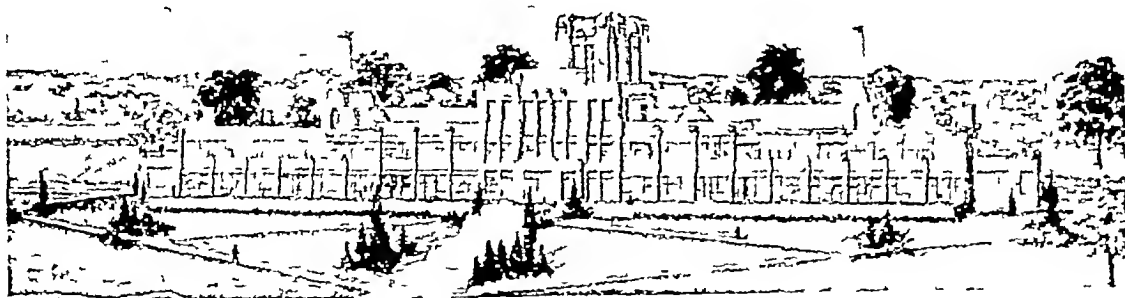
Euclid-Mentor Sanatorium has been given the high-

est rating as a fine tuberculosis hospital. The medical department is under the direction of Dr J C Placak, Jr. Registered nurses are constantly in attendance.

Equipment in private rooms and wards includes excellent hospital beds, inner spring mattresses, Kenwood blankets and the necessary bedside equipment.

Restricted to thirty-five beds in order to allow more individual care, Euclid-Mentor is an ideal sanatorium where instruction in the way of living after leaving the hospital is given much attention. The rates, \$21.00 to \$40.00 per week, include medical and nursing service, x-ray, pneumothorax and laboratory fees.

For information and reservations write Joy Mansfield, 1014 Republic Bldg., Cleveland or Euclid-Mentor Sanatorium, Mentor, Ohio.



PLEASANT VIEW SANATORIUM

AMHERST, OHIO

Pleasant View Sanatorium, the Lorain County Sanatorium for the care of tuberculosis, opened its doors to the first patients in December 1931. The Sanatorium consists of three modern buildings of local sandstone located in a beautifully landscaped setting on North Ridge Road, one mile east of Amherst. It is located at approximately equal distances from the two larger centers of population, Lorain and Elyria.

The main sanatorium building is modern, convenient and well equipped. There are quarters for 84 patients in two wings. There are private rooms and double rooms, all of which face away from the road to a terraced open park which contains a small lake.

The children's building, situated immediately to the east of the main building, has accommodations for 12

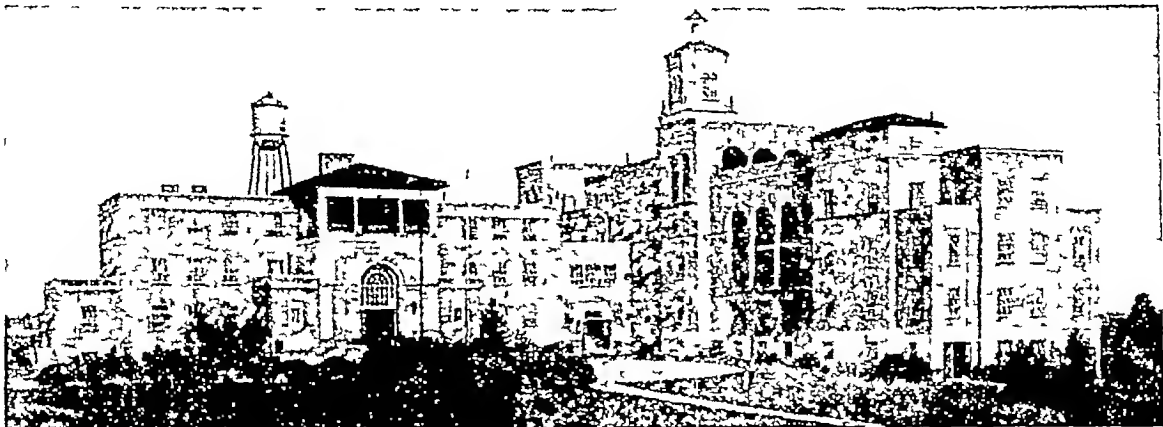
children, including a play room and a school room. A full-time teacher is employed.

The Sanatorium is governed by a board of three trustees who are appointed by the county commissioners: Mr. Dunn, Mr. Davidson, and Mr. DeChant, and to whom they are responsible. There are 43 employees under the supervision of Dr. D. H. Minnis, Superintendent, Mr. G. L. Slater, Business Manager, and Miss G. Lahiff, Supervisor of Nurses.

The Sanatorium staff, in addition to caring for the patients in the Sanatorium, conduct three clinics per week for outside patients.

Admission to the Sanatorium is limited to residents of Lorain County.

Ohio Sanatoria



MOLLY STARK SANATORIUM

CANTON, OHIO

The Molly Stark Sanatorium, located on route 62 half way between Canton and Alliance, was constructed by a building commission appointed by the Board of Commissioners of Stark County. The cost was nearly one million dollars. It is situated on a tract of 40 acres, and includes five buildings. The main structure has a capacity for 128 patients. It contains offices, medical facilities, x-ray and operating rooms. It also provides kitchen and service rooms. A children's cottage accommodates 38. A nurses' home is provided, as well as a cottage for the superintendent. A laundry is incorporated in the central heating plant.

The medical staff consists of the superintendent and one resident physician. A consulting staff of local physicians provides for general and orthopaedic surgery, eye, ear, nose and throat, and other medical advice. Specialists in genito-urinary conditions, dermatology, and proctology are available. A dentist is employed. All surgical procedures needed are performed at the institution. All types of tuberculosis are received.

A Board of Trustees appointed by the County Commissioners has charge of the institution and the spending of the funds appropriated by them.



MT. LOGAN SANATORIUM

CHILlicothe, OHIO

The Mt Logan Sanatorium is a district tuberculosis hospital organized in 1916 under the laws of the State of Ohio by the counties of Fayette, Highland, Jackson, Pike, Ross, and Scioto, and opened for admission of patients in July 1918.

Authority to operate is vested in a board of trustees, one member from each county, appointed by the respective boards of county commissioners. Mr J J Butler, Hillsboro, Ohio, Chairman, Miss Vesta E Yaple, Chillicothe, Ohio, Secretary, Dr Louis H Senteff, Chillicothe, Ohio, is the Resident Medical Superintendent.

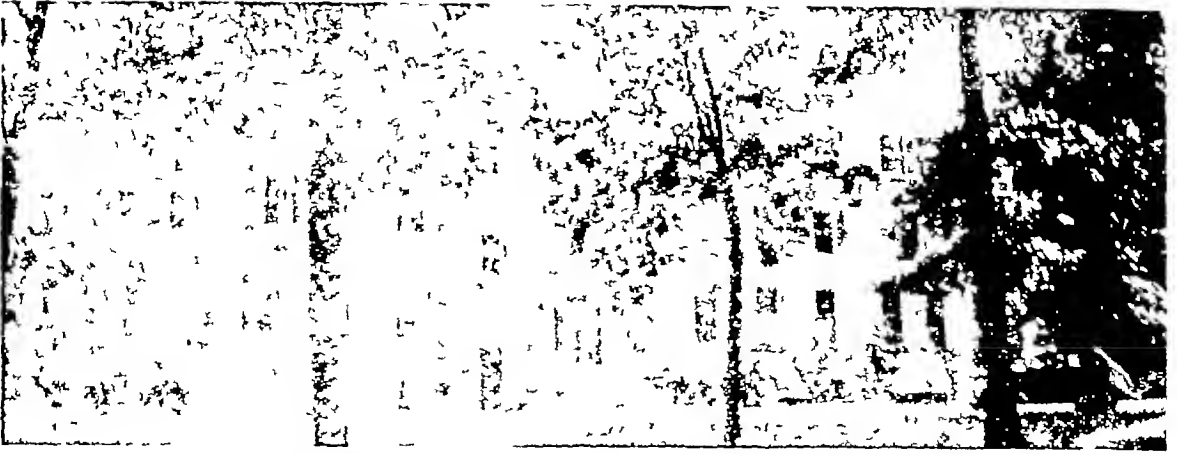
The Sanatorium is situated about one mile west

of the court house, on an elevation three hundred feet above the Scioto River valley, facing Mt Logan to the east, a setting to inspire the idea for the Great Seal of Ohio.

Number of beds in the beginning were 24, present capacity, 64. Average daily census during 1939, was 62. Seventy per cent of resident patients receive pneumothorax treatments, and a growing number (35) of former sanatorium patients return for refills.

Through cooperation with the Department of Research Surgery, Ohio State University, all the latest advances in chest surgery are available to our patients.

Ohio Sanatoria



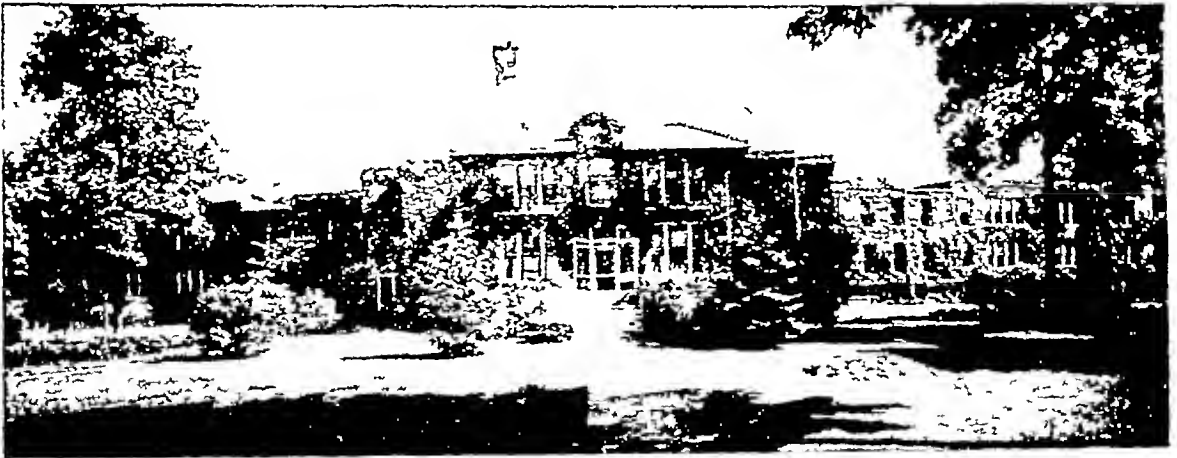
J. M. CASE TUBERCULOSIS SANATORIUM

DELAWARE, OHIO

The J M Case Tuberculosis Sanatorium was established in 1934 by the directors of the J M Case Hospital and Dr Louis Mark as a non-profit tuberculosis sanatorium in conjunction with the J M Case General Hospital Dr Louis Mark has been medical director since its inception The capacity is 45 beds All types of tuberculosis cases are cared for, and complete facilities for both medical and surgical work are present

In the hospital Dr Henry Bachman is resident physician.

The sanatorium facilities are available to patients of Delaware County and surrounding counties The rates are \$21 00 per week which includes medical and surgical care nursing service, x-ray and laboratory fees and pneumothorax



LIMA DISTRICT TUBERCULOSIS HOSPITAL

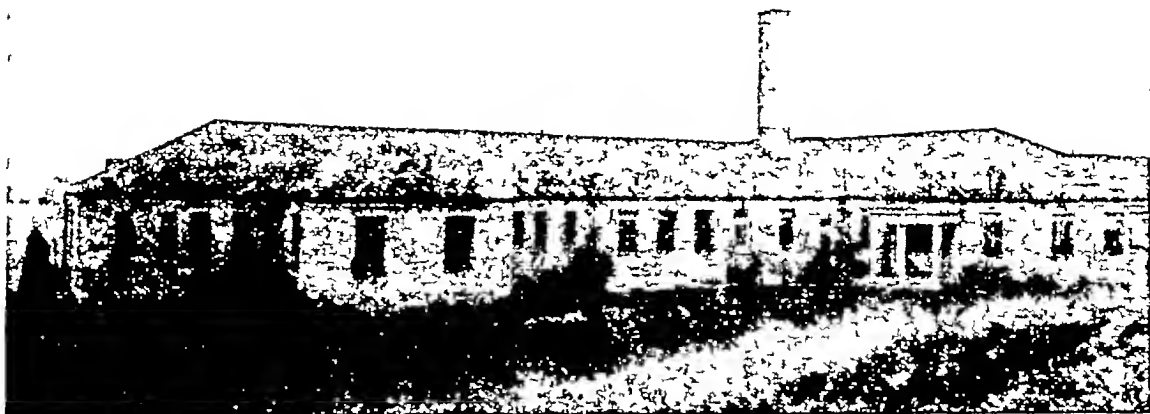
LIMA, OHIO

The Lima District Tuberculosis Hospital was dedicated in April 1911, and in the ensuing years operated progressively both in the treatment of tuberculosis and in the improving of housing facilities for patients and employees The original capacity of the hospital was thirty-five beds In 1926, the capacity was increased with the addition of two wings and

in 1934 by the construction of an annex In 1936 a nurses' home was erected

At present the hospital has a capacity of 125 beds and is one of the three remaining district hospitals operating in the state of Ohio It is owned by Allen, Auglaize, Mercer, Van Wert and Shelby Counties Patients with all types of tuberculosis are admitted

Ohio Sanatoria



TUSCARAWAS VALLEY SANATORIUM NEW PHILADELPHIA, OHIO

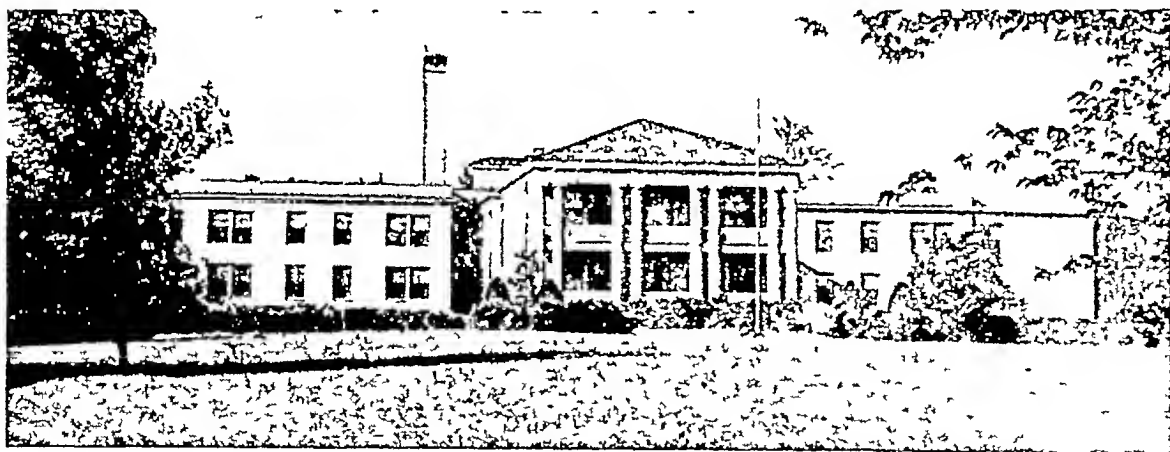
Tuscarawas Valley Sanatorium is a 35 bed institution built and equipped in 1937, at a total cost of \$100,000. Moderately advanced and advanced cases are accepted as patients. The Sanatorium is located two miles east of New Philadelphia overlooking the Tuscarawas River.

The original Board of Trustees consisted of Carl Keplinger, Dover, C. V. Wlandt, Port Washington, and D. L. Fisher, New Philadelphia. Since that time Harry Smith has replaced Mr. Wlandt on the Board. Dr. William Hudson has served continuously as Su-

perintendent since the opening of the Sanatorium.

Complete clinical service and an active out-patient department are maintained throughout the year for indigent and referred cases of active or suspected tuberculosis.

An adjoining plot of ground is owned by the Tuscarawas County Tuberculosis and Health Association and will be used for the erection of a Preventorium at a future date. This group is quite active in aiding the Institution. At present a Registered Nurse, Mrs. Elizabeth Barr, is employed to do the field work.



BELMONT SANATORIUM ST. CLAIRSVILLE, OHIO

Ten hundred and fifty feet above sea level—among the sun-kissed hills—and devoted to the care and treatment of tuberculosis, Belmont Sanatorium is located on a forty acre tract of land, four and a half miles west of St. Clairsville, Ohio, the county seat, on Federal Route No. 40.

A substantial fire-proof brick structure, it nestles in the northern edge of a delightful grove of hardwood trees, on ground which slopes gently to the south.

The Sanatorium, with a bed capacity of 52, opened

its doors for the reception of patients in November 1927, and serves a population of about ninety thousand people industrial, mining and farming.

It is maintained entirely by the county out of appropriations from the general fund and is administered by a board of trustees appointed by the county commissioners.

W. Miles Garrison, M.D. has been the Medical Superintendent since its opening.

Ohio Sanatoria



CLARK COUNTY SANATORIUM SPRINGFIELD, OHIO

The Clark County Tuberculosis Sanatorium is the successor of the Second District Tuberculosis Hospital which was organized in 1910 by Madison, Greene, Champaign and Clark Counties. A fifty-five acre estate on the National Pike east of Springfield, was purchased and remodeled. Cottages were built on the grounds. The first patients were transferred from a "T B Camp" on October 20, 1910. There have been over 2800 admissions.

After fifteen years, the District was dissolved and Clark County purchased the interests of the other counties, and built a new Sanatorium building.

The treatment afforded, besides the usual basic

rest, includes pneumothorax, pneumonolysis, phrenic nerve surgery, bronchoscopy and thoracoplasty. Each patient is considered individually in staff conference.

The present bed capacity is twenty-five children in a separate building, and ninety-five adults in the Main Building. The institution is essentially for residents of Clark County, but patients from other counties are admitted, if beds are available, after a completed application for admission is received.

John Srail, M.D., F.A.C.C.P., is Superintendent and Medical Director, Wm. A. Clark, M.D., is Assistant Superintendent, C. Walker Munz, M.D., is Thoracic Surgeon.



Wm. W. ROCHE TUBERCULOSIS HOSPITAL TOLEDO, OHIO

This is a modern 165 bed county sanatorium. It is a one story building divided into five wings. Each wing is in charge of a graduate nurse trained in Tuberculosis. Kathryn Lynch, R.N., has been directress of the institution since it opened on Sept. 20, 1937.

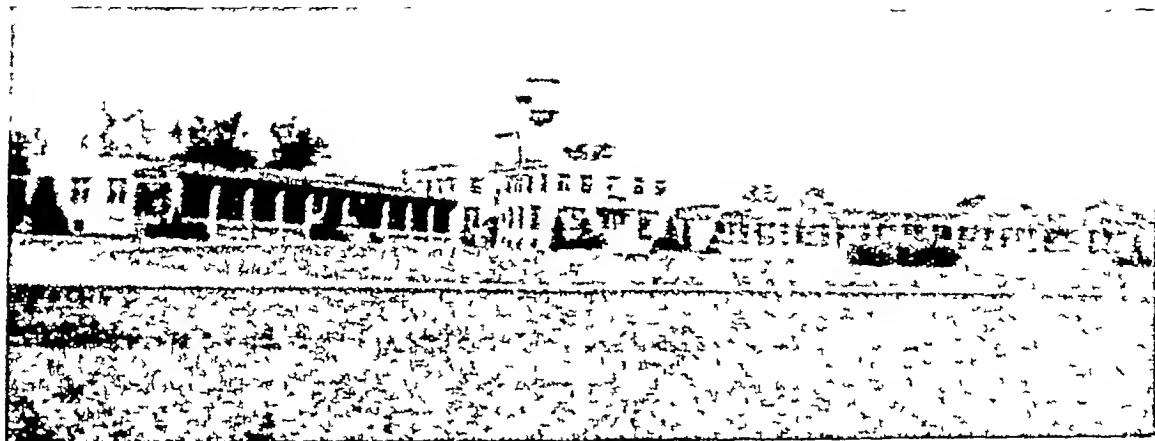
All the modern methods of diagnosis and collapse therapy are used. There are available x-ray and laboratory departments. All the minor surgery, such as pneumothorax, phrenics, pneumonolysis, etc., is performed in special treatment rooms. Major sur-

gery, such as thoracoplasty, is performed at the Lucas County Hospital, which adjoins the sanatorium.

The hospital staff consists of a medical director, Dr. Paul Holmes, a surgical department under the supervision of Dr. Wm. Neill, a resident physician, Dr. M. W. Selman and two internes.

There is an active out-patient department where pneumothorax treatments are available. A recreational supervisor and a vocational rehabilitation service is available to the patients.

Ohio Sanatoria



Trumbull County Tuberculosis Hospital WARREN, OHIO

The Trumbull County Tuberculosis Sanatorium of fifty beds was opened in 1928

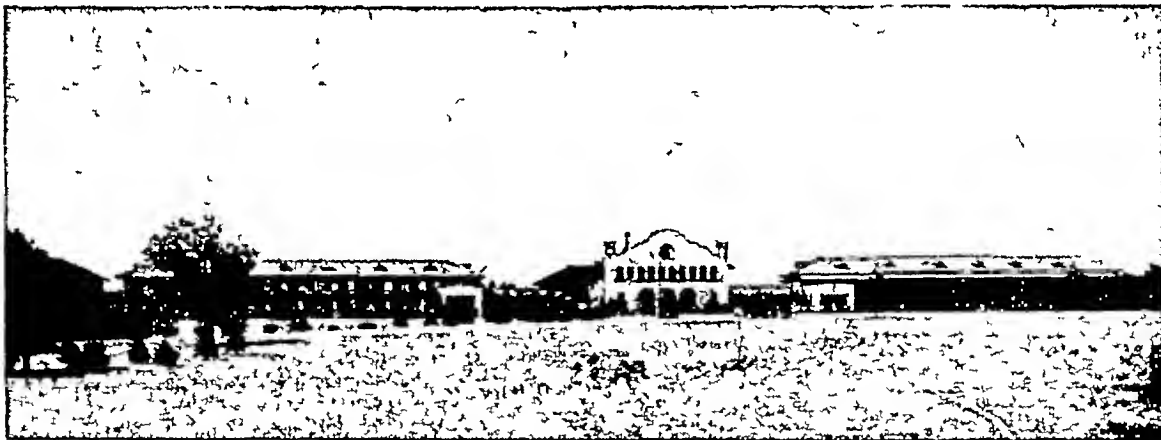
The Sanatorium is located six miles from Warren Ohio on the highest elevation in the County It is one mile from the main highway, assuring a quiet restful atmosphere to the patients There are twelve acres of landscaped lawns with an abundance of flowering shrubbery and several hundred pine trees

The building is of the pavilion type with a center administration building, flanked on one side by the Womens' Wing of twenty-five beds, and on the other side by the Mens' Wing of twenty-five beds Half of

the beds are in private rooms

Dr Edgar P Adams has been Medical Director continuously, since the Sanatorium opened in 1928 During that time 1033 cases have been admitted for treatment Less than one per cent have left against advice Dr Joseph Keough of Youngstown Ohio, performs the chest surgery A dietitian, technician and six graduate nurses are employed

Weekly diagnostic clinics are held Supervision is maintained over post-Sanatorium patients and contact cases by a full-time Field Nurse A weekly clinic for pneumothorax treatments is also maintained



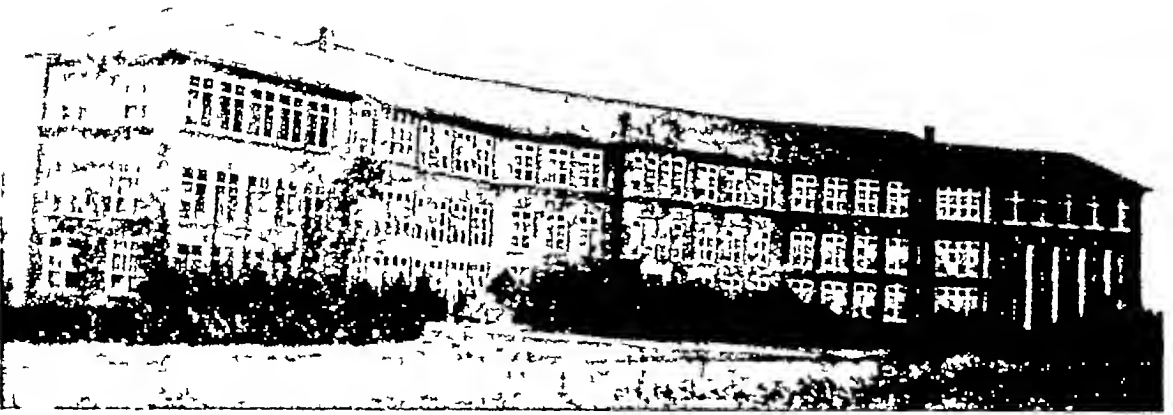
SUNNY ACRES WARRENSVILLE, OHIO

Sunny Acres, the Municipal Sanatorium of the City of Cleveland, is located at Warrensville, Ohio; on the outskirts of Cleveland The Sanatorium grounds comprise about seventy-five acres There are ten buildings housing 430 patients and 200 employees, 40 additional employees are not maintained on the Sanatorium grounds Of the 430 patients, 64 are children The Sanatorium is built on the pavilion plan and is two stories in height The most recent section, caring for 100 patients, was opened in 1931 All stages of pul-

monary tuberculosis are cared for and collapse therapy is given, except for major surgical procedures which are performed at the Cleveland City Hospital

The professional staff includes 52 registered nurses and 6 full-time physicians, in addition to the Medical Director F W Ramsey, Director of Public Health and Welfare, City of Cleveland R H Browning M.D Superintendent and Medical Director Charles Schoen Business Manager

Ohio Sanatoria



MAHONING TUBERCULOSIS SANATORIUM YOUNGSTOWN, OHIO

The Mahoning County Tuberculosis Sanatorium was opened on November 23, 1925 with a bed capacity of 67. In 1930 a cottage for 16 patients and a nurses' home with a capacity for 10 nurses was built.

In 1936, under W.P.A., a third floor was added, increasing the capacity of the Sanatorium to 180 beds. At the same time, a surgery laboratory, dental office and other minor operating rooms were added.

The Sanatorium is now equipped to do all types of surgery. There are 94 physicians on the visiting staff, representing all specialties.

The house staff consists of the medical director, Dr. E. E. Kirkwood, three resident physicians, x-ray technician, laboratory technician, dietitian and 23 registered, trained nurses.



The Mount Royal Sanatorium NORTH ROYALTON, OHIO P. O. Brecksville, Ohio

Located 15 miles southeast of Cleveland, Ohio
Elevation 1240 feet 50 acres of rolling country estate
Capacity 110 beds For all stages of adult Pulmonary Tuberculosis All modern methods of collapse therapy employed

Norbert S. Greene, M.D.
Medical Director

Interpretation of Chest X-Ray Films

DAVID W HEUSINKVELD, M.D., F.A.C.C.P.
Cincinnati, Ohio

The interpretation of the shadows seen on the films of the chest involves more than simple identification of what meets the eye. If one keeps in mind the dynamic forces of pathological reactions, much can be actually seen and as much more inferred.

There is such a wide variation in the appearance of films of healthy individuals, principally because of size, shape and age, that to describe a normal chest is impossible, it is most important however, to think in terms of the healthy chest. One should study the films of many healthy people to learn average appearances before attempting to describe and interpret the changes resulting from pathological processes.

All that can be seen on any x-ray film is the shading from black to white forcing us to identify the original structure by the densities it casts upon the film. As the x-rays pass through a chest, the resulting pattern on the film permits us to study anatomy without actual dissection, and as disease complicates the shadows on the film, we may study pathology without actually seeing the tissue with the unaided eye or through the microscope. This necessarily imposes certain limitations upon complete diagnosis, but it is often an invaluable aid in directing the campaign toward that end.

To get the most out of a chest film an orderly approach is necessary, and we follow the example of the anatomist of proceeding from that which is external to that which is internal. The soft tissues on the outside of the bony cage must be scanned for irregularities and for the state of nutrition. The latter is best determined by studying the axillary folds where malnutrition throws them out in bold relief, above the clavicle and along the lateral wall. The breast shadows of the female may be significant, particularly when one of them is absent.

All of the visible bones on the film must be carefully studied. Anomalies of the ribs are not infrequent, contraction of the ribs resulting from organized pleural exudate and adhesions may be noted. Old or recent frac-

tures may give a clue to other obscure shadows. In apical densities, destruction of the overlying ribs will distinguish between a heavily thickened apical pleura and a superior pulmonary sulcus tumor. Pulmonary emphysema causes the ribs to leave the spine more horizontally than normal.

In studying the internal soft tissues of the chest, it is helpful to consider them as being suspended from the base of the skull after the manner of a pendulum. If they are dislocated from their normal positions, a pathological process may be exerting a pulling or pushing force. This factor is usually easy to determine and is most important. Rapidly growing tissues such as tumor or fluid will push, while scar tissue exerts a pulling force. The loss of a normal constituent of the chest will cause a dislocation of the remaining viscera toward that side, such as occurs when air is absorbed from the alveoli, producing atelectasis.

In properly exposed films, the decreased density of the trachea and mainstem bronchi should be visible. Normally, the trachea is in the midline, sloping slightly to the right in its lower portion if the patient's position is symmetrical with that of the central ray. Deviation of the trachea is significant except in scoliosis. Narrowing of the trachea and mainstem bronchi should be looked for.

Normally, the aorta is always to the left side of the spine at about the level of the fifth thoracic vertebra. The width of the aortic arch varies with the age and size of the individual. It sometimes appears to be abnormally wide in fat individuals because of the upward lift of abdominal fat. This is also true for the heart shadow. Calcification in the arch is frequently noted together with apparent elongation in the later years of life.

The size, shape and position of the heart should be carefully studied. It is well to remember that the apex of the heart, as seen on the film, usually does not correspond with the clinically measured apical beat when the mid-clavicular line is used as the base line. In both instances it is more accurate to use

the mid-sternal line. The heart is easily shifted from its normal position by pushing and pulling forces. Both the heart and aorta can be dislocated upward by fibrotic contractions in one or both of the upper lobes.

The domes of the diaphragm should normally be smooth, gently arched, the right about $1\frac{1}{2}$ cm higher than the left. Irregularities, tenting, and attachments to the lateral walls should be noted for evidences of subdiaphragmatic influences, and for the presence of pleurisy. In pulmonary emphysema they are apt to be lower and flatter than normal.

The pleurae are normally invisible. Thickening of the pleura is often visible under the second ribs in apparently healthy people. An old pleuritis can frequently be detected under the ninth rib in the mid-axillary line. Interlobar thickening can be seen as linear markings, though seldom do they show the entire extent of the interlobar fissure. Calcification of the pleura is the late result of pleural effusion and not infrequently of hemothorax and empyema.

The anatomical hilum is wholly outside of the lung and is best seen on the film on the left side, only the left bronchus and the pulmonary artery showing up as distinct entities. The x-ray hilum, which lies lateral to the anatomical hilum, is easily seen, but is difficult to describe, it is made up of the first divisions of the mainstem bronchi, the pulmonary artery and vein, bronchial artery and vein, lymph glands and supporting connective tissue. Its vertical limits are fairly constant and are covered by two interspaces and a rib. The upper border of the left hilum is formed by the superior surface of the pulmonary artery, the upper border of the right hilum by the eparterial bronchus. The outer limit is indefinite, extending almost to the imaginary line of the inner third of the lung. Its density is variable under normal conditions but with properly exposed films one should be able to look through it. When of a heavy homogeneous character, it is definitely abnormal. One should look for enlarged lymph nodes as well as for evidence of calcification. It is important to remember that the upper portion of the lower lobe covers the hilum density, and that this area is frequently involved in pathological pro-

cesses. Good stereoscopic films are necessary to separate the densities for accurate localization. Between the bronchi to the lower lobes and the heart there is normally a more or less rectangular dark area, seen best on the right side. When this area is obliterated, it is definitely pathological, it is frequently mistaken, then, as an enlarged hilum density, whereas it is wholly outside of the hilum and represents a lesion in the lower lobe.

The trunk densities are composed of bronchus, pulmonary artery and vein, bronchial artery and vein, lymphatics and supporting connective tissue. It is impossible to separate these densities into their component parts. They vary in size normally, and end short of the periphery of the lung, when extending to the pleura, some abnormality is present. Variation in the size of the trunks may be due to bronchial, vascular or lymphatic lesions. Simple bronchial infections do not change the pattern sufficiently to permit an etiological diagnosis, chronic bronchial infections that are generalized are apt to show abnormally heavy trunks. These heavy trunks may suggest a chronic bronchial infection, but the final diagnosis must rest upon substantiating clinical findings.

Heavy trunks in a localized area may suggest bronchiectasis, but this diagnosis should not be made from the films alone. Enlarged trunks secondary to cardiac lesions may be suggested by an irregularly shaped heart. With advancing age, the trunks become heavier but not actually larger, due to changes in the arterial walls. Trunks that are tortuous are due to vascular changes rather than to disease of the bronchi. The perivascular and peribronchial lymphatics may modify the appearance of the trunk densities as a result of previous respiratory infections. Beading or studding of the trunks not uncommonly follows tuberculous infection, probably as a result of scarring.

By studying the distribution of the trunks, it is possible to localize the lobes of the lungs. This is important and is possible only with good stereoscopic films. Foreign bodies should be localized in the correct bronchus and lobe for the best bronchoscopic approach. Abscess cavities can be localized for accurate surgical approach, cavities in the apex of the lower lobe overlie a considerable portion of the

upper lobe and only by studying their relation to bronchi can they be accurately localized. It is not possible here to give the anatomical distribution of the bronchi to their respective lobes. Suffice it to say that by careful study of good stereoscopic films accurate localization of the lobes is possible, some films showing it to much better advantage than others.

It is not my purpose, nor is it possible, to cover the x-ray findings of all lung lesions, but rather to show how the problem of interpretation is approached. A good example is that of pulmonary emphysema. With the aid of a microscope, the diagnosis is made by studying the alveoli, the problem is more complex when studying only the films because we can't see the individual alveoli on it. In the first place, we must have fixed in our minds the appearance of an emphysematous chest, the emphysematous lung itself and the clinical manifestations of the disease. Then, when studying the films, we may note that the ribs leave the spine more horizontally than is normal, the lung fields are somewhat blacker because of the increased air content, the trunk densities are heavier and are more widely separated than average, the pulmonary arteries stand out prominently at the roots of the lung and in the hilum density, the domes of the diaphragm are low and flattened. This combination of clues is definite evidence of the presence of pulmonary emphysema, but any one of these observations is not sufficient to establish the diagnosis. The fluoroscopic examination would show in addition that the movement of the diaphragm was limited and held in a state of inspiration, that the bases of the lung failed to darken on complete expiration and that the heart was separated from the anterior chest wall. Such a build-up is necessary because of the indirect methods of examination.

Simple exudative lesions in the lungs cast densities on the film of a homogeneous character. One might say then that a bronchopneumonia or a lobar-pneumonia is suggested, but an exact etiological diagnosis is not possible. The only infectious disease that can be etologically diagnosed is chronic apical pulmonary tuberculosis, and its relapsing characteristics permit such a diagnosis. The

differing densities of exudate, caseation, fibrosis and calcification represent lesions of different ages which form a pattern characteristic of only tuberculosis. This pattern is classically found only in the upper lobes. The tuberculous lesions limited to the lower lobes remain undifferentiated and only the finding of tubercle bacilli in the sputum permits a positive diagnosis. Cavities present in the upper lobes usually have sufficient associated pathology to make possible an accurate x-ray diagnosis of tuberculosis, but cavities in the lower lobes are associated only with exudate, which may have other etiological factors. In general, we may say that x-ray films record the existence of exudate in the lung, but from that fact alone we are unable to make an etiological diagnosis except in some cases of the chronic type of apical pulmonary tuberculosis.

Benign tumors can occur anywhere in the chest, showing densities on the film of any size and shape, but usually with smooth contours. Accurate diagnosis is extremely difficult. Primary malignant tumors occur in all manner of form without definite distinguishing features, but if clues are diligently sought for a great deal of presumptive evidence may be found. In all instances, additional evidence is necessary to establish an exact diagnosis. Tumors of the bronchi are apt to be occlusive, resulting in absorption of air distal to the obstruction. This may involve the distribution of a single bronchus, an entire lobe or the entire lung, depending upon the location of the tumor. The resulting atelectasis produces a dislocation of all viscera and the corresponding half of the diaphragm to that side.

The lateral view of the chest is valuable in that it throws into bolder relief some conditions that may only be suspected from the standard antero-posterior view. It may also show conditions that do not appear at all in the antero-posterior exposure, namely the posterior border of the heart, the deep sulci posterior to the domes of the diaphragm, and the horizontal arch of the aorta. In studying pulmonary emphysema, the upper anterior and posterior dark areas are shown to good advantage and it may show separation of the heart shadows from the anterior chest wall. When the heart is adjacent to the anterior chest wall in the presence of pulmonary

emphysema, pericardial adhesions are present. Interlobar effusions are often more clearly defined in the lateral view.

The use of lipiodol in bronchography emphasizes the limitations of the plain film. A well filled bronchial tree provides exceptional opportunity to study the size and shape of the bronchi and the localization of the lobes. It is the method par excellence in determining the degree and extent of bronchiectasis. It is of less value in studying cavitation, whether tuberculous or non-tuberculous, because the majority of cavities cannot be made to fill and show fluid levels. It is often difficult to differentiate parenchymal and pleural densities, with the injected bronchial tree this difficulty is more easily resolved by noting the distribution and configuration of the trunks. A mass in the pleura or pleural

cavity bulging into the lung field results in distortion of the bronchi. Bronchography is particularly useful in studying bronchial obstructions, whether due to foreign body, new growths, or bronchial stenosis, and, where the obstruction is due to a bronchogenic carcinoma, aids in determining operability.

Conclusion

The interpretation of the densities observed on x-ray films of the chest demands a knowledge of normal anatomy, the pathogenesis of disease primarily or secondarily involving the chest, the dynamic forces exerted by pathological processes, and finally the correlation of the densities, symptoms and physical findings. Much confusion will be avoided by consultation between roentgenologist and internist.

A BRIEF SUMMARY OF THE TUBERCULOSIS CAMPAIGN IN OHIO—(Continued from page 359)

was established under the Ohio State Board of Health with a legislative appropriation of \$40,000 for the biennium.

Between 1914 and 1920 not much advance was made in the creation of new machinery or agencies to control tuberculosis due to the dislocation caused by World War No. I.

In 1920 a direct approach to the school health problems was begun with the institution of the Modern Health Crusade by the Ohio Public Health Association with the active cooperation of the State Department of Education. In 1922 a "Course in Hygiene" was prepared for the teachers in the schools. In 1923 the General Assembly passed the "Physical Education Law" and in 1927 the first supervisor of health and physical education was employed in the State Department of Education.

The first educational campaign on the Early Diagnosis of Tuberculosis was conducted in Ohio in 1927. Increased emphasis began to be placed upon the value of the x-ray and tuberculin test in discovery of early cases of tuberculosis.

In the years intervening between 1927 and the present time the program in Ohio has been devoted not so much to creating new agencies and institutions as it has to implementing and strengthening the avenues of attack which were initiated in the early years of the campaign. Today we are concerned with the problems of tuberculosis in industry, among the negroes and among the young women. We enter the final stages of the battle with our forces well organized to meet successfully whatever emergencies may arise.

ROBERT G. PATERSON, Ph.D.

CHARLES OLIVER PROBST, M.D.

(Continued from page 360)

consumption is a contagious disease, and that without proper precautions every patient is a source of danger to those about him."

Following this clear-cut expression of professional opinion, Dr. Probst plunged into the fight against the disease in earnest. In 1894 the State Board of Health issued its first popular educational circular on the subject. It was entitled "The Prevention of Consumption." Thus was launched the educational movement against the disease which has been gaining momentum with the passing of the years.

In a paper read before the Section on State Medicine of the British Medical Association held at Toronto in 1897 we find Dr. Probst advocating hospitalization of cases of tuberculosis by state and local government authorities. This paper marks the beginning of the sanatorium movement in the state.

At a meeting of the State Board of Health, April 10, 1901, Dr. Probst presented a report on the subject of tuberculosis and recommended the organization of a state association for the prevention of tuberculosis. This suggestion became a reality on November 14, 1901, when the Ohio Society for the Prevention of Tuberculosis (now the Ohio Public Health Association), was organized.

These three lines of endeavor mark in broad outline the form of the fight against the disease in Ohio. Throughout the remainder of his life, Dr. Probst was identified closely with the national, state and local developments in the tuberculosis movement. The bibliography of his writing is illuminating as it shows his intense interest in the leading public health problem of his day. He died of pneumonia in Columbus on April 2, 1933, being slightly over 75 years of age.

A Twin Spirometer for Bronchspirometry

PAUL W. GEBAUER, M.D. *

Cleveland, Ohio

The purpose of this paper is a description of a twin spirometer which I have designed for clinical bronchspirometry. This instrument is used with a special rubber catheter, but could be used with any similar device such as the double bronchoscope described by Jacobaeus and Frenckner.¹

A description of my catheter and the technique of its use in bronchspirometry have been published.² Figure 1A is a diagram illustrating how the catheter separates the air channels to the lungs and permits the study of each side separately and simultaneously. These catheters are sold by American Cystoscope Makers Inc. They are made of latex and contain enough barium to make them easily visible under the fluoroscopic screen. A steel coil spring is incorporated in the catheter wall which produces a desirable semi-rigidity. The catheter is supplied in three sizes so that it is adapted to the wide range of bronchial dimensions produced by collapse as well as by the variation in the size of patients. It is advisable to use as large a size as possible. The largest can be used only in large males. The smallest size is used in small females, or in those patients in whom pulmonary collapse has caused a contraction of the left bronchus. The right main bronchus has been found unsatisfactory for bronchspirometry because of the short distance between the carina and the right upper lobe orifice, consequently, stenosis of the left main bronchus may make the procedure impossible.

The catheter is inserted through the glottis by means of a direct laryngoscope, and then guided into the left bronchus with the aid of the fluoroscope. Its natural curvature to the left facilitates this passage. It is usually passed down until the tip is visible just lateral to the left cardiac border. Good anesthesia is essential and is accomplished by spray and intratracheal injection.

Relative dryness of the tracheobronchial tree is desirable so that postural drainage or cough and expectoration are carried out be-

the catheter is in position the balloons are inflated and each side of the catheter is connected to a separate respiratory spirometer.

I first used two standard basal metabolism forehand. Sometimes atropine is helpful. After apparatuses for spirometers, and although fair records were obtained, they were not entirely satisfactory. The speed of the moving record could not be accelerated, and rapid shallow respirations, therefore, were not well separated. The usual basal metabolism apparatus has a capacity designed for both lungs, and a rather voluminous spirometer bell of large diameter. With such an instrument, an inspiration of 500 cc might cause only a 1 cm fluctuation of the bell, and when it is connected to a single lung, in which the tidal volume may be 200 cc or less, the fluctuation on the record is too small. In addition, two instruments recorded each lung on a separate record, rather than both lungs on a single graph.

For these reasons, with the financial aid of Cleveland City Hospital and its staff, the McKesson Appliance Company of Toledo, Ohio constructed a special twin spirometer (Figure 1B). This instrument records the fluctuations of both lungs on the same record. The record carrier is driven by an electric clock mechanism which can be accelerated. The record consists of a graphic paper from which one can calculate oxygen consumption per minute, tidal volume, complementary and supplementary volumes, and vital capacity. Each small square in the vertical axis represents a respiratory volume of 50 cc or 50 cc of oxygen and in the horizontal axis, one tenth or one twentieth of a minute depending on the speed used (Figure 2B). Each spirometer bell has a capacity of four liters. This apparatus makes a suitable record with every variety of respiration. Satisfactory records have been obtained when the respiratory rate was 40 per minute, and the tidal volume of one lung was less than 100 cc.

Inasmuch as ventilation is recorded and usually corresponds to the carbon dioxide output, it was thought that for clinical purposes, it would not be necessary to include in the

* From the Department of Thoracic Surgery, City Hospital, and Western Reserve University, Cleveland, Ohio.

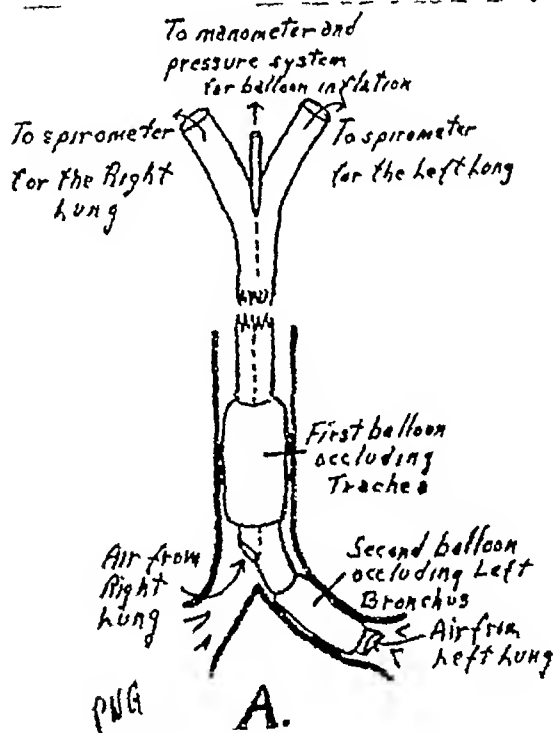
instrument the equipment for the measurement of carbon dioxide. Each bell contains a soda lime cannister for the absorption of carbon dioxide, rather than a caustic solution and acid for its liberation and subsequent measurement.

An air pressure manometer is installed on the instrument panel for the inflation of the balloons. Screw valves are incorporated in the catheter connections so that the patient may be shunted from the apparatus to room air or vice versa. The electric motor is driven by alternating current, and is coupled with a chain drive, gear shift mechanism which permits acceleration or slowing of the record by simply turning a knob.

An example of the type of record is reproduced in Figure 2B. It indicates that the pulmonary function is practically the same on each side. The roentgenogram (Figure 2A) shows a bilaterally equal collapse with extrapleural pneumothorax on the right, and intrapleural pneumothorax on the left. Before

extrapleural operation this patient had a fairly good vital capacity and no clinical discomfort in spite of the collapse on the left side, so that bronchspirometry was not deemed necessary before the institution of a revocable extrapleural collapse. However, if thoracoplasty had been indicated, it would have been comforting to know that the left side, in spite of the pneumothorax, was capable of such good function.

There are patients with diminished respiratory capacities who need bilateral or even unilateral collapse whom we cannot treat safely until we know the separate functions of the two sides. Bronchspirometry will often tell us that a thoracoplasty might be hazardous, and a revocable collapse much safer. At times, it will indicate that even a phrenic would provoke too much dyspnoea. Occasionally, we will find a partly collapsed lung which, in spite of clinical and x-ray evidences, has sufficient function to permit rather extensive collapse on the other side.



A—Diagram of catheter in position in the trachea and left bronchus. Air from the left lung is confined to the left barrel of the catheter by the distal balloon. Air from the right lung is trapped between the balloons and therefore enters the sidehole opposite the right bronchus, and is confined to the right barrel of the catheter.

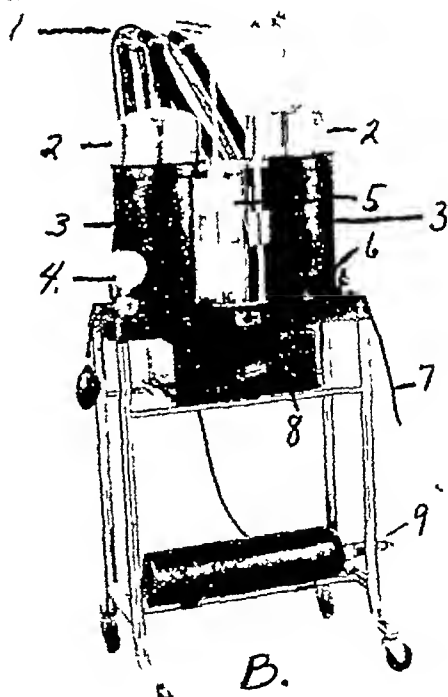


FIGURE I

B—Photograph of twin spirometer. 1—two-way valves in tips for connection to the catheter. 2—spirometer bells. 3—water-seal cylinders containing rubber flap valves and soda lime cannisters. 4—air pressure manometer and hand-bulb for balloon inflation. 5—writing points and graphic record on revolving shaft. 6—switch for electric clock motor. 7—cord to wall plug. 8—switch for acceleration of record. 9—oxygen tank for filling of spirometer bells.

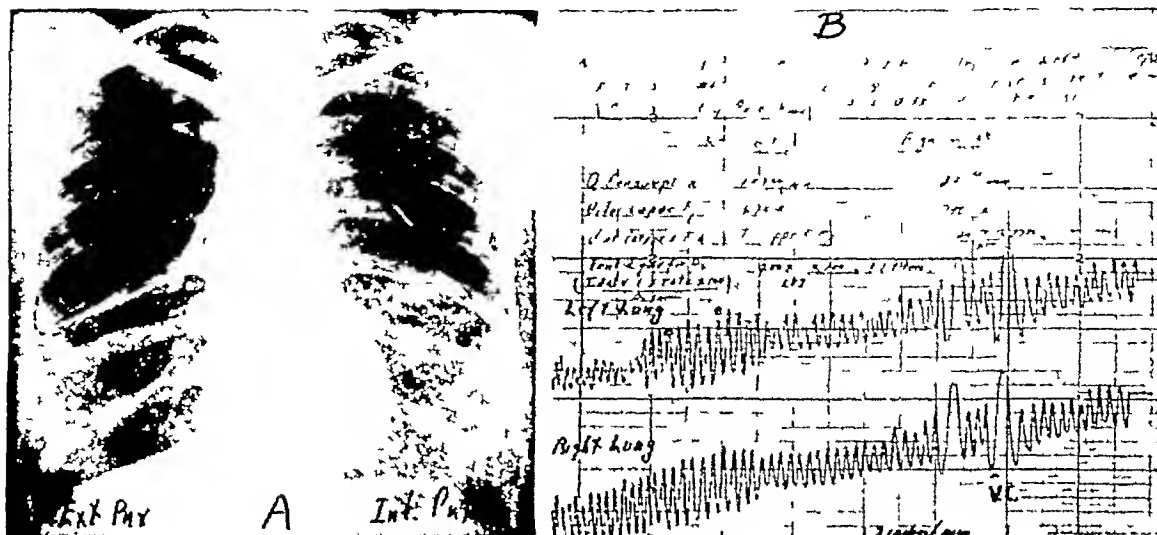


FIGURE II

A—Chest roentgenogram of a 27 year-old white female with a right extrapleural pneumothorax of 9 months duration and a left intrapleural pneumothorax of 1 years duration. Onset of tuberculosis 2 years previously with bilateral apical cavities. Sputum now absent. Marked clinical improvement. Vital capacity 1400 cc.

B—Bronchspirometry record at time of roentgenogram in A. The gradual climb of each curve represents the oxygen consumption of that lung. Respiratory rate is 16/min. Average tidal volume is 200 cc for each lung. Vital capacity is 675 cc on the left and 700 cc on the right. The records are quite similar. The greater superior excursion of the intrapleural side, as noted fluoroscopically, was balanced by the greater diaphragmatic excursion on the extrapleural side. Possibly because of the more extensive original disease on the left side, its oxygen intake per minute is slightly less than on the right.

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JOHN H. LOWMAN, M.D.

(Continued from page 360)

Dr. Lowman awakened the public to the possibilities of conquering tuberculosis and inspired many to "do something about it." A man of broad culture, he was loved alike by the layman and professional worker, the poor and the wealthy. Dr. Lowman's biographers agree that his essays surpassed any literary efforts in Cleveland medical circles. He also composed 70 sonnets.

Italy, a land that always delighted and enchanted Dr. Lowman, lured him to his death. He journeyed to Italy in September, 1918, as

medical director of the American Red Cross Tuberculosis Mission. The vicissitudes of ocean travel, scientific inquiry and military life culminated in an attack of influenza soon after he landed in Rome. Dr. Lowman returned to America where he died in New York City, January 23, 1919.

The late Hon. Newton D. Baker, then secretary of war, paid this tribute to Dr. Lowman:

"When the world's great test came, he could not help sacrificing himself to minister to the stricken and suffering. Surely he died a soldier's death after living, in the best sense of the words, a physician's life."

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History of the West Virginia Tuberculosis
and Health Association

GEORGE F EVANS, M.D

At a meeting of the American Anti-Tuberculosis League in Atlanta City in 1907, Mrs S W Price of Scarbro, West Virginia was invested with authority to promote a state-wide organization in West Virginia. In December of 1907, there was organized the West Virginia Anti-Tuberculosis League. This was the first concerted effort in West Virginia to promote any scheme of tuberculosis control. Dr Harriet B Jones of Glendale, West Virginia, was appointed Executive Secretary in 1908. Dr Jones is the pioneer of all tuberculosis efforts in West Virginia and from her untiring efforts, often supported with little financial resource, there was laid a firm foundation and structure for all the Anti-Tuberculosis work that has since developed in West Virginia.

The tuberculosis league was instrumental in securing appropriations for a small state sanatorium in 1913. The league, during the same year, was able to influence two counties to open their own sanatoria, and persuaded three counties to employ full-time tuberculosis nurses.

The first Red Cross Seal Sale was begun in 1909 and state funds were used to continue the exhibit service, and to provide tuberculosis surveys in several counties. Tuberculosis nurses and a full-time physician were employed as funds were available. The league kept alive the agitation for tuberculosis beds in Sanatoria and a slow but continuous program of construction went on at the State Sanatoria.

In November 1920, the West Virginia Anti-Tuberculosis League became known as the West Virginia Tuberculosis and Health Association, and the work was reorganized. During this year Mr George C Rowell came from New Hampshire to assume the duties of Executive Secretary. More county surveys were undertaken to determine the extent of the tuberculosis problem. As a result of these surveys, full-time county health units were permanently established in several counties of West Virginia. Counties during this period were urged to set up their own societies, integrated with the state society. The more populous counties quickly developed their own organizations and carried on their own seal sale fund raising programs. About five counties during this period built county sanatoria, where far-advanced pa-

tients could be hospitalized.

Whenever funds were available, tuberculosis clinics were held under the auspices of the county and state associations. In the fall of 1925, Dr H G Wildman was appointed as full-time state clinician. Dr Wildman had not only a wide experience in clinical tuberculosis, but with unusual tact, was able to promote an interest in tuberculosis that had not before been present in West Virginia. After his death in 1927, the medical program lagged. In 1930 the state legislature granted to the state association \$10,000 per year for clinic services, providing that the state association would expend an equal amount. This sum permitted the employment of three full-time nurses and qualified physicians were employed on a fee basis from several of the large cities. The association purchased two portable x-ray units. This service has been continued by successive legislatures.

This clinic service has examined 30,008 patients and taken 15,747 x-ray pictures. Of this number 1,710 patients with active curable tuberculosis have been referred to sanatoria. More than 120,000 tuberculin tests have been performed. West Virginia has now a mobile x-ray unit operated through the State Department of Health, so it is probable that much of this field work will now be taken over by official bodies and the State Tuberculosis Association will confine more of its time to educational purposes.

The state association has spent 27.4 per cent off all its funds on medical service. The average percentage of funds spent by state associations for this service according to the National Tuberculosis Association compilation is 5.6 per cent. Through the effort of the West Virginia and Health Association, thirty-two counties now have their own tuberculosis societies. Six of these have been organized during the summer of 1940 through the efforts of Mr E P Wells who was recently added to the state personnel in the capacity of Field Secretary.

On September the 14th, 1940, the Association was deeply grieved by the death of its Executive Secretary, Mr George C Rowell. The activities of the organization are at this time under the direction of the acting Executive Secretary, Mr E P Wells.



WALTER EDWARD VEST, M.D

1882 -

Dr Vest is an exceedingly modest man, so modest that it has been difficult to obtain information about him for this brief sketch

He is a Virginian, born in Floyd County, in 1882, the son of William Madison and Mary Susan (Boone) Vest. He was graduated from William and Mary College in 1902, where he won a Phi Beta Kappa key. He taught German at William and Mary for two years after graduation, and has been sufficiently interested in his Alma Mater since then to work actively in its alumni association, of which he was president in 1927. In 1936 the alumni medallion was conferred upon him for his service to the alumni association.

He completed a four-year course at the Medical College of Virginia in three years, and was a member of the Phi Beta Pi there. He took his M.D. degree in 1909. After a period of internship and postgraduate study in Richmond and New York, he began a general practice in Meherrin, Virginia. In 1915 he moved to Huntington, West Virginia, and specializes there in internal medicine. He was president of the General Alumni Association of the Medical College of Virginia in 1931.

He was married in 1910 to Miss Saddle Blankinship, of Brookneal, Virginia, and they have a son, Walter, Jr., now following in his father's footsteps as a student in the Medical College of Virginia.

During the World War, Dr Vest was Chief of the Medical Service at the base hospital at Camp Wadsworth, South Carolina, where he was highly

Tuberculosis Pioneer in West Virginia

regarded and is affectionately remembered by his associates.

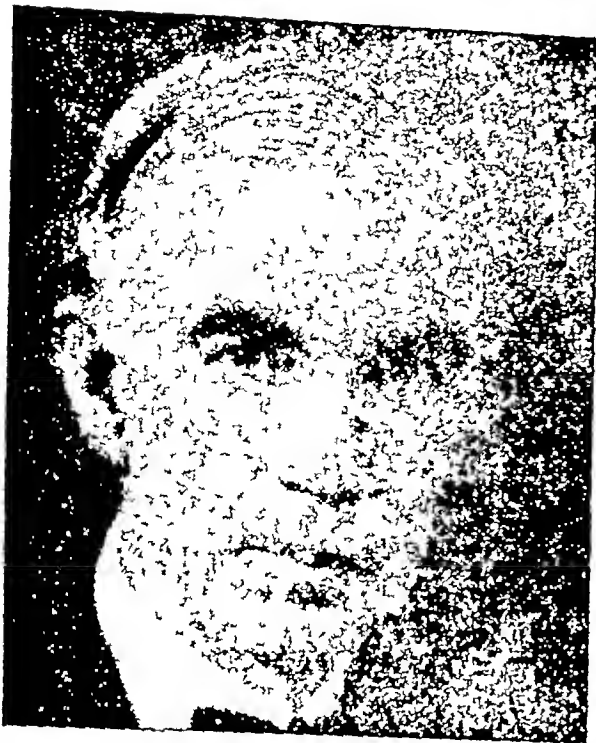
Dr Vest is a member of the American Therapeutic Society and a Fellow of the American College of Physicians, formerly on the Board of Governors of that organization. He is also the Governor of West Virginia for the American College of Chest Physicians. He is President of the Public Health Council (Medical Examining Board) of West Virginia and has been for several years a member of the House of Delegates of the American Medical Association. He is now serving as a member of the Committee of Seven of the American Medical Association, to meet with representatives of the Federal Government to consider a health program for the United States.

In West Virginia he has worked tirelessly for organized medicine. He has been president of the county and state medical societies, of the Chesapeake and Ohio Surgeons' Association, and associate editor, and editor, of the *West Virginia Medical Journal*, one of the best and most widely read of the state periodicals. He is affiliated with the Methodist Church, the Masonic Order, the Kiwanis Club, and is a democrat.

The Southern Medical Association has had his enthusiastic support since 1913. He became a member of its Council in 1925 and Chairman in 1929, in which position he served for two years. He has also been Chairman of the Section on Gastroenterology, and in 1938 became President.

Dr Vest does not drink or play cards, and is not even a golfer. According to his intimates, his chief diversion is medical reading. Organized medicine, like many of the world's great governments, is now under stress from many quarters. It needs in prominent positions men of ability, ideals and clean life, whose characters are, like Dr Vest's, a guarantee of capable and unselfish leadership of which future generations will be proud.

Tuberculosis Pioneers in West Virginia



J. G. PETTIT, M.D.

1880 - 1929

Dr J G Pettit was born at Trimble, Ohio, in 1880. He attended Ohio University at Athens, and graduated in Medicine at Loyola Medical School, Chicago, in 1902.

After graduation, Dr Pettit came to West Virginia and commenced the practice of medicine at Clay Court House. There he remained for four years. He went to Chicago for some graduate study and returned to West Virginia as Staff Physician at the Weston State Hospital at Weston, West Virginia. He remained in Weston continuously for eighteen years.

In 1924 Dr Pettit was requested by Governor Morgan to take the Superintendency of the State Sanitarium at Hopemont, West Virginia. Dr E E Clovis who had been Superintendent since the establishment of the Institution had resigned to enter private practice.

Dr Pettit remained at Hopemont until his death on December 20, 1929. During his five years as Superintendent, he was responsible for many improvements in the Institution. The Sanitarium enlarged from 260 to 425 bed capacity. A new modern hospital and a children's building were added during this period. Changing methods of treatment were effected at the Institution during his term of office. For four years Dr Pettit was President of the West Virginia Tuberculosis and Health Association and in this capacity he furthered clinic activities and tuberculosis health education throughout the state. He was a competent physician, capable administrator and kindly adviser to thousands of patients who still revere his memory. He did more to influence legislation for Sanitarium expansion than any other West Virginian.

He is survived by his widow, Mrs Grace Goss, and three children, Mrs George Evans, Clarksburg, Mary Lou Pettit and Dr H S Pettit.



GEORGE C. ROWELL

1874 - 1940

The history of Tuberculosis in West Virginia contains no brighter name than that of George C Rowell. Mr Rowell was born in Ogdenburg, New York. He graduated at Union College, Schenectady in 1899, and for several years thereafter was actively engaged in newspaper, magazine and educational activities. At one time he was Secretary for the Schenectady Chamber of Commerce. He acquired a great deal of training in the field of Social Service and Public Health and was Inspector of Hospitals, Sanatoria, Dispensaries and Children's Institutions in the state of New York for a period of ten years. Mr Rowell was secretary of the New York Conference of Charities and Correction for two years and resigned this position to go to New Hampshire as executive officer of the New Hampshire Tuberculosis Association.

In 1920 he came to West Virginia as Executive Secretary of the West Virginia Tuberculosis and Health Association. He held this position for twenty years until his death on September 14, 1940. Throughout these years he labored untiringly for the cause of tuberculosis and developed a clinic service which brought medical service to all corners of West Virginia. He developed his state Association to its present high level, with affiliates in more than half of the counties of the state. During Mr Rowell's administration as Executive Secretary of the West Virginia Tuberculosis and Health Association, a number of tuberculosis sanatoria were built throughout the state. He was a tireless worker and he enthused others to become interested in the fight against tuberculosis.

He is survived by his widow, Mrs Gertrude Hurd Rowell, for many years his able assistant. His daughter, Mrs Lewis Buesmann, resides in Detroit. West Virginians, interested in the eradication of Tuberculosis will not forget the work of Mr George C Rowell.

West Virginia Sanatoria



HOPEMONT SANITARIUM

HOPEMONT, WEST VIRGINIA

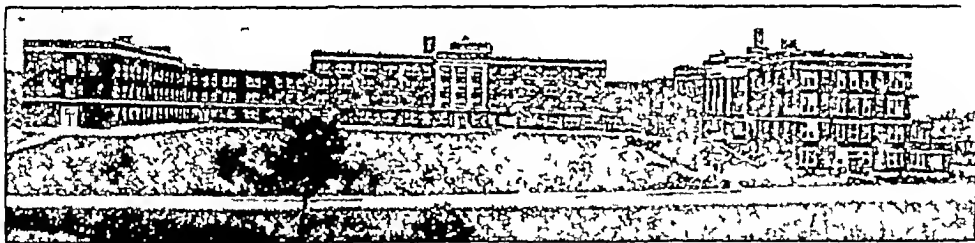
Hopemont Sanitarium is a hospital of 475 beds for the treatment of pulmonary tuberculosis under the management of the Board of Control of the State of West Virginia, and maintained by appropriations of the State Legislature and by collections from patients.

The first unit of Hopemont Sanitarium was constructed in 1913 and was dedicated on June 12, 1913. It was a frame cottage capable of housing 22 patients. Since 1913 eleven units for the care of patients have been added. Also the necessary buildings such as dormitories, houses, laundry and farm buildings have been constructed.

Patients, who must be residents of the State of West

Virginia are admitted by application. Because of the difficulty of carrying out complete studies in many parts of the state, patients are admitted for observation and 20 per cent of the admissions are non-tuberculous and run the entire gamut of diseases of the chest.

Hopemont Sanitarium is located at Hopemont, Preston County, West Virginia. It is approved for Residency in Tuberculosis by the Council on Medical Education of the American Medical Association and by the College of Surgeons. Its facilities are used by the Medical School of West Virginia University for teaching purposes.



PINECREST SANITARIUM

BECKLEY, WEST VIRGINIA

Pinecrest Sanitarium was established by a legislative act in 1927 and was completed in 1930. The original unit was constructed to care for approximately 125 adult patients. The purchase of the property on which the sanitarium was built was a gift from the citizens of Beckley and Raleigh County. The first superintendent of the institution was Dr. Geo. Grisinger of Charleston. The present superintendent is Dr. K. M. Jarrell, who took charge of the institution on November 18, 1933.

The need of room for additional patients became so urgent that the 1937 legislature and the P.W.A. appropriated funds for new buildings. Before this new unit No. 2 was completed there was still more urgent need for additional room to care for the patients and a gift was obtained of \$125,000 from the Department of Public Assistance of this state and was matched by a P.W.A. appropriation from Washington in the amount of approximately \$100,000.

The plans were drawn for this additional building and construction was started at once. Both of the buildings were completed in 1939 and joined to the

original building and exist in the shape of a quadrangle with a large open space in the lawn. The total cost of the sanitarium with the additional buildings exceeds \$1,000,000.

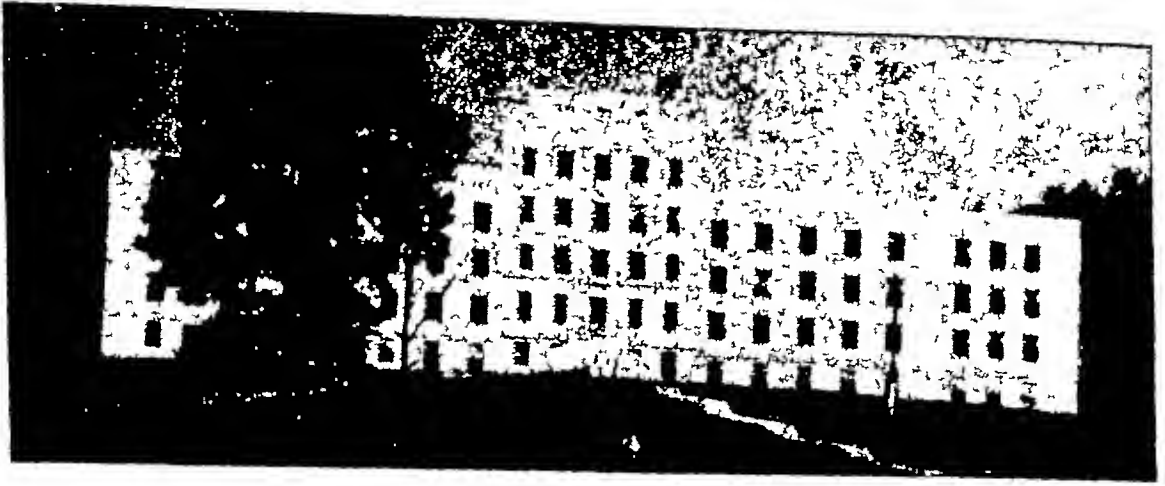
The additional buildings provided beds for approximately 465 patients, and at the present time we have in the institution 465 patients, and a small waiting list still exists.

The appropriation for 1939 to 1941 was \$321,360 to be used in running the institution. The charge to the patients is \$1.00 per day, payable thirty days in advance. It costs approximately \$2.10 per day to take care of each and every patient.

At the present writing there is a new appropriation to build thirty-six additional rooms to the Nurses Home which will house seventy-two nurses and other female help.

With a waiting list at the present time, it is expected that it will be necessary to construct in the very near future an addition to the present institution for additional patients.

West Virginia Sanatoria



DENMAR SANATORIUM

DENMAR, WEST VIRGINIA

The Denmark Sanatorium of today far surpasses the institution made possible by an act of the 1917 West Virginia Legislature. In 1919 the doors of the State Colored Tuberculosis Sanitarium, as it was then known, were opened to receive for treatment its Negro citizens suffering with tuberculosis. Today, with its improvements and modern equipment and well trained personnel it brings to an actual realization the hopes and aims of those who helped to set up this institution some 20 years ago. Located on one of the ranges of the Alleghany Mountains in Pocahontas County with an elevation of more than two thousand feet above sea level, away from the ever present coal dust that is evident in many sections of the State away from the bustle and ado of the busy cities, overlooking

the picturesque Greenbrier River, noted throughout the State for its wonderful fishing holes then too in the fall and winter deer can be seen on the river bank seeking water, stands a massive concrete fire-proof building with modern equipment.

On September 1, 1940 the patient population stood at 120 with many applications on file. Due to the progress being made by medical science in the treatment of tuberculosis and the interest displayed by the staff of well trained doctors in using the approved methods of treatment as advanced by medical science much progress is being made in helping to check this dreaded disease. At the present time a Pathological Laboratory is being equipped so that further research work can be done.



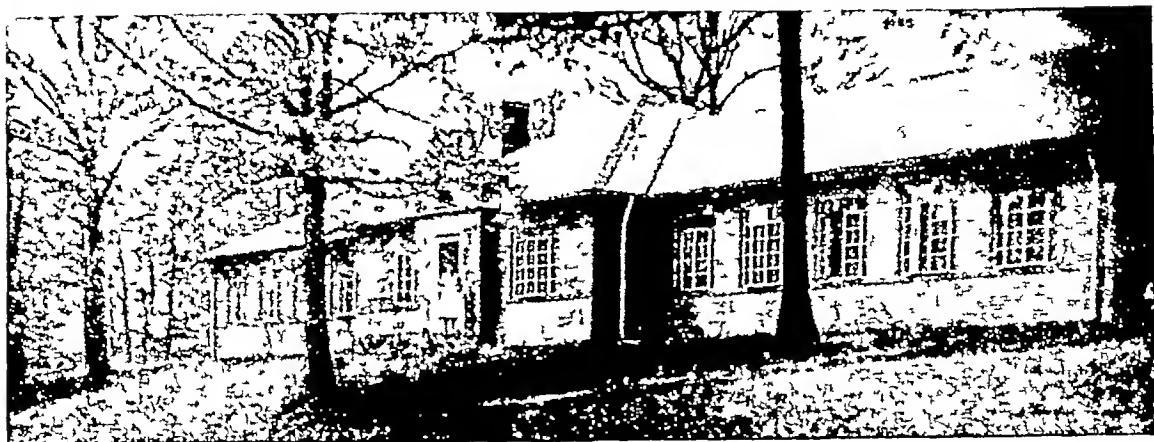
EASTMONT SANATORIUM

MORGANTOWN, WEST VIRGINIA

Located three miles from Morgantown, seat of West Virginia University, is EASTMONT SANATORIUM. It is charmingly situated on a hill in a beautiful private park near Cheat Mountains. It was established in 1926 by the

Monongalia County Tuberculosis Association, and has a capacity of thirty-five beds. Mrs. Susan Cook, R.N., is the Superintendent and Dr. G. R. Maxwell is Chief of Staff.

West Virginia Sanatoria



THE KANAWHA ANTI-TUBERCULOSIS LEAGUE AND HILL CREST SANATORIUM CHARLESTON, WEST VIRGINIA

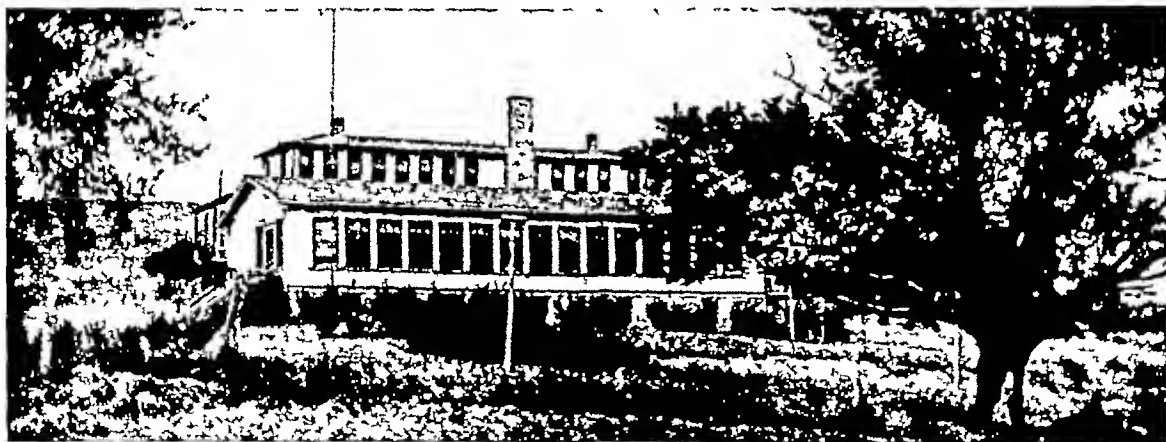
Three years after anti-tuberculosis work was started in Kanawha County, a summer camp for underprivileged children was opened on the ground where Hill Crest Sanatorium now stands. This was in 1911 and it was not until the following winter that the Charter for the Kanawha County Anti-Tuberculosis League was formally issued. For thirty years the care of tuberculous children and children from homes in which there are open cases of tuberculosis has been one of the first interests of the League.

From the first summer camp, the sanatorium grew slowly until, today, Hill Crest is equipped to take care of forty children. There are three permanent brick buildings located on a thirty-five acre tract on a mountain overlooking the beautiful Kanawha River, and plans are developing for replacing the last re-

maining frame building with a twenty-six bed boy's dormitory.

After the first world war soldiers were sent to Hill Crest for treatment, and from 1919 until 1930 both adults and children were admitted. When the State of West Virginia opened a new tuberculosis hospital at Beckley, Hill Crest was again limited to children.

The Kanawha County Anti-Tuberculosis League for several years has brought a portable x-ray unit into the county, and during the last year over a thousand x-rays were made especially among children of high school age. Several of the cases discovered by these x-rays are now at Hill Crest. Through Dr. Leo Mynes, the county physician, children are regularly tuberculin tested. Dr. W. L. Cooke is the Medical Director.



MARSHALL COUNTY SANATORIUM MOUNDSVILLE, WEST VIRGINIA

Following a survey of health conditions in Marshall County, conducted by their Tuberculosis Association, the County Court became cognizant of the dire need of a sanatorium for their unfortunate ones who were afflicted with the great white plague. In 1924, funds were appropriated by the County Court for the building and maintenance of a twelve bed sanatorium.

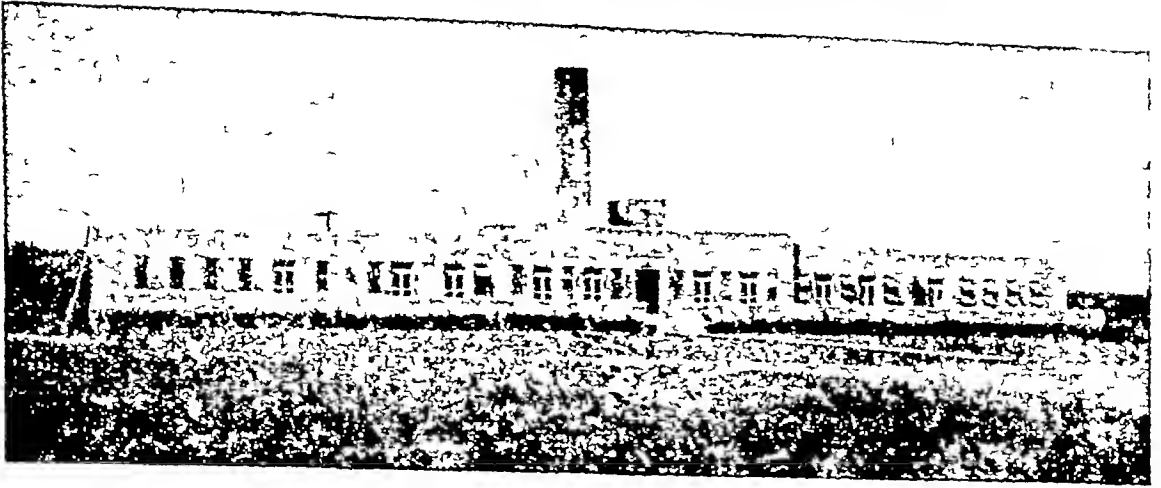
To assure quiet surroundings, the site selected was on the crest of a hill overlooking the City of Moundsville, West Virginia. This institution was not long functioning until the demands for treatment neces-

sitated an addition to the original structure, thus providing facilities for the care and treatment of thirty-two patients, its present capacity.

Residents of this county receive first consideration. However, other applicants are at times admitted by payment of a nominal fee either by the patient or by the County Court in which the patient resides.

X-ray equipment has recently been installed in this institution. Dr. Charles G. Morgan is the Medical Director.

West Virginia Sanatoria



OHIO COUNTY SANATORIUM RONEY'S POINT, WEST VIRGINIA

Commanding a picturesque view of the hills of West Virginia, Ohio County Sanatorium is beautifully located on the hill top of the spacious four hundred acre County Farm, about ten miles distant from the City of Wheeling.

This haven for those afflicted with tuberculosis owes its origin to both the Ohio County Anti-Tuberculosis League and the Board of Commissioners, who in 1928 became keenly interested in establishing a worthwhile and satisfactory tuberculosis program. In that year, the first sanatorium was erected—a frame building with a capacity of sixteen beds. However, the number of patients seeking admission to this institution so far exceeded the accommodations that adequate expansion was necessary. As a consequence, on December 31, 1934, the pioneers of the Anti-Tuberculosis

League again met with the Board of Commissioners and discussed ways and means of erecting a fully-equipped sanatorium that would accommodate about forty patients. Aid was sought from the Federal Emergency Administrator who not only approved the proposed project for the construction and equipment of our present sanatorium but agreed to pay about 30 per cent of the cost or approximately \$46,000.00. On September 17, 1936, this very modern fire-proof structure was dedicated—a sanatorium which represents an accumulation of the best that is known to medical science for the control of tuberculosis. Our institution as the name implies, is restricted to patients of Ohio County and is owned and operated by the County. Dr. E. E. Clovis is the Superintendent.



WAYSIDE FARM PREVENTORIUM PARKERSBURG, WEST VIRGINIA

Wayside Farm Preventorium is located near Parkersburg in Wood County. It is now in its eighth year of service as a year-round program carried on under the auspices of the Wood County Tuberculosis League. The initial cost was approximately \$15,000. The upkeep has been shared jointly with the community, county and state. From its inception in 1924 as a summer camp, to the present time more than one thousand children ranging in age from one to twelve years have benefitted by a period of treatment. All children are given the Mantoux test before admittance and x-rays are made when indicated.

The preventorium has furnished the means by which the contact was broken between the person ill with tuberculosis and the child, also it gives the child the advantage of a well-regulated regimen of care. Wayside Farm provided such protection when beds were not available within the state for the tuberculous sick.

Results have been gratifying to the community, yet we look forward to the time when the state may have a bed for every case of tuberculosis and when no child shall be deprived of a normal family life. Dr. E. T. Goff is the Medical Director.

Diagnosis of Intestinal Tuberculosis

DAVID SALKIN, M.D., and A. V. CADDEN, M.D., F.A.C.C.P.

Hopemont, West Virginia

Intestinal tuberculosis occurs as an ulcerative lesion complicating pulmonary tuberculosis, as a hypertrophic mass, and as a millary form associated with tuberculous peritonitis. The ulcerative lesion is the most common of the three varieties and its diagnosis can be made with a high degree of accuracy. The chief method of diagnosis is roentgenological and its development has been due chiefly to the work of Pirie, Stierlin, Brown and Sampson. The taking of a careful history is of next importance. The clinician must be familiar with the natural history of the various dyspepsias to evaluate properly the symptoms present. Laboratory findings are usually of little aid in diagnosis.

Ulcerative intestinal tuberculosis is always a complication of pulmonary tuberculosis and often shows an activity parallel to that of the parent lesion. However, it frequently runs an independent course and may cause severe symptoms or death after the pulmonary lesions have become inactive. A study of over 300 cases shows a similar incidence in males and females. All ages are represented and the older patients have an incidence similar to younger patients, but the older the enteritis the less distressing are the symptoms. At Hopemont Sanitarium, the autopsy incidence of enteritis is 70 per cent. Clinically, however, it occurs in 15 to 20 per cent of the sanatorium population, where a great majority show far-advanced disease in the lungs. In a tuberculosis sanatorium the non-tuberculous dyspepsias are about four times more frequent than those due to tuberculous enteritis. In this series, only 1 per cent of the cases occurred in association with minimal pulmonary disease, 9 per cent occurred with moderately advanced disease, and 90 per cent with far-advanced disease. The exudative pulmonary lesion was associated with 25 per cent of the enteritis cases, and the chronic form with the remaining 75 per cent. Pulmonary cavitation was present in 94 per cent of the cases at the time of onset of bowel symptoms, cavitation had been present in 4 per cent prior to the onset of symptoms, no cavity was found

in 2 per cent of the cases whose diagnosis was made by laparotomy or autopsy. The sputum was positive for tubercle bacilli in 97 per cent at the time of onset of the symptoms.

Intestinal tuberculosis may be present without symptoms. Ten per cent of the enteritis found at autopsy showed no digestive disturbances during life. Enteritis may be present long before symptoms appear and may be started clinically by a pulmonary spread, pleural effusion or an operation. The reason for such variability, we believe, is due mainly to a local neuromuscular irritability plus an afferent-parasympathetic efferent reflex to the involved segment. We feel that this neurogenic view best explains the clinical onset of enteritis, its severity, symptomatology, duration and response to treatment.

The onset of symptoms was sudden in 67 per cent and gradual in 33 per cent. The rapid onset often dates back to some food or laxative or surgical intervention. Although collapse therapy benefits greatly about 40 per cent of all cases of intestinal tuberculosis, yet some cases date their onset to some form of collapse therapy and other cases show an aggravation of symptoms by these procedures.

The symptoms of enteritis may be many or few, mild or severe, local or general. Systemic symptoms may include nervousness, insomnia, chills, fever and failure to gain weight. The digestive symptoms occur in the following order: Anorexia, 85 per cent, crampy pain, 80 per cent, nausea, 70 per cent, diarrhea, 65 per cent, flatulence, 50 per cent, vomiting, 45 per cent, epigastric distress or pain, 30 per cent, constipation, 20 per cent, pyrosis, 20 per cent, tender right lower quadrant, 10 per cent, acid regurgitation, 10 per cent, constipation alternating with diarrhea, 10 per cent, gross blood in stool, 6 per cent, appendicitis, 4 per cent, allergic phenomena in 2 per cent.

Diarrhea and pain occur in two-thirds of all cases and should one wait for these symptoms to appear many early cases will be missed. In this group we include also the cases

who show only a change in the character of the stool from a normal to a soft consistency and without increase in the daily number, these form about 10 per cent of the diarrhea group. Pain and diarrhea occur in some cases that show no enteritis at autopsy, these are regarded as being due to a tuberculotoxemia. Occasionally, pelvic disease and more rarely cholecystitis will produce diarrhea for varying periods of time.

A common triad of symptoms occurring in 12 per cent of the cases includes constipation, crampy pain and pain in the right lower quadrant. Anorexia may be due to the general tuberculous toxemia or a disturbed intestinal gradient. In our studies, about 80 per cent of the anorexias occurring with enteritis are due to a disturbed gradient, and correction of the gradient often produces a good appetite and hunger sensation in the face of a hopeless pulmonary lesion with severe toxemia and high fever. Gross blood in the stool is of uncommon occurrence in enteritis and is of severe prognostic significance. Unusual symptoms frequently occur. One case had recurring attacks of chills, fever, leucocytosis. X-ray examination showed an enteritis and therapy cleared the symptoms immediately. Several cases showed allergic reactions of hives, diarrhea and abdominal distress upon ingestion of raw milk and fruits, correction of the intestinal gradient caused an immediate disappearance of these symptoms. Some cases presented typical attacks of appendicitis, but were proved to be enteritis. Two cases showed only a foul putrid odor of the stools.

Tuberculosis of the ileocecal area may show symptoms usually associated with the function of the esophagus, stomach and upper jejunum. For that reason, we have divided the symptoms into the divisions, gastric and intestinal. The gastric symptoms include acid regurgitation, pyrosis, nausea, vomiting, epigastric distress, and upper abdominal flatulence. The intestinal symptoms include crampy pain, diarrhea, and lower abdominal distension, constipation and blood in the stool. The intestinal symptoms are produced locally and the gastric are referred and due to a deranged gradient elsewhere in the digestive tract. Most cases show both groups of symptoms. However, in four per cent, only gastric

symptoms were present and in eight per cent, only intestinal. In four per cent, the gastric symptoms were mild and in six per cent the intestinal symptoms were minimal. Six per cent of the cases showed normal stool studies with no previous diarrhea, constipation or both.

Physical examination of the abdomen is usually negative. Frequently some tenderness may be present in the right lower quadrant or over the course of the colon, but the signs are not pathognomonic of enteritis. In extensive cases the sigmoidoscope may be used for direct visualization of the ulcers.

Laboratory studies include chiefly the examination of the stool for blood and tubercle bacilli, gastric analyses and coprologic studies. When there is gross blood present in the stool one must rule out hemorrhoids, fissures, fistulae and hemoptysis. The benzedrine reaction is of little value in the diagnosis of enteritis. Prior to the test, the patient should be on a meat-free diet for at least three days and if positive one must rule out gingivitis, swallowing of blood-streaked sputum and postnasal discharge. During sleep these discharges, as well as bloody sputum, are often swallowed. The presence of the specific organism in the stool is of no value for it may be found in the feces of all cases of open pulmonary lesions without any enteritis. Again, many children who do not expectorate and adults with a low-grade cough reflex may show the organism in the stool with no apparent expectoration. When the acid-fast organisms are found in the stool it is further necessary to use cultures and guinea pigs to rule out other acid-fast organisms which are not pathogenic and are frequently present. Many cases of advanced pulmonary disease show abnormal gastric acidity curves and hypoacidity and improper digestion of fats and proteins, but none of these is pathognomonic for enteritis. Blood studies usually show no changes. A leucocytosis associated with pain in the right lower quadrant may mean appendiceal involvement which may be tuberculous or non-specific.

The most accurate method of diagnosis is roentgenologic. One may give barium orally or by enema. Both are frequently used, but in our hands the oral route has proved to be about seven times more diagnostic than the

enema A modified Brown-Sampson technique is used and observations are made at six, nine, twelve and thirty hour intervals The double meal may be used six hours apart Each case is fluoroscoped at every interval and plates are made The enema does not often give a positive diagnosis when the oral route is negative, but it should be used in puzzling cases The reasons for this discrepancy between meal and enema are due to the fact that the enema is an abnormal load for the colon and finer grades of irritability are missed by the sheer weight of the solution, that the enema must be retained for at least 5 to 15 minutes prior to taking plates, that the meal gives a better insight to the physiologic disturbances present We have gained no special information from the use of the double contrast air-barium enema in the study of this disease

The roentgenology of ulcerative enteritis is predominantly that of the terminal ileum, appendix, cecum and colon Although unusual emptying of the small gut or prolonged filling of a segment may point to enteritis of the small bowel, yet in the great number of cases the diagnosis is conjectural However, the small bowel is almost always associated with involvement of the cecum or colon, which lend themselves easily to x-ray observation

In a follow-up study of our cases we have begun to regard all pathological ulcerative enteritis to be productive of symptoms in 90 per cent of cases and to be asymptomatic in 10 per cent Of the symptomatic group, about 85 per cent produce definite x-ray changes and 15 per cent do not Thus, in a given series of pathological enteritis, one may find positive x-ray findings in 78 per cent with and without symptoms, and negative x-ray findings in 22 per cent with and without symptoms We have found in our series that a positive x-ray diagnosis means enteritis in over 95 per cent of cases However, a negative diagnosis in the face of highly suspicious symptoms is only 30 per cent reliable, and a suspicious x-ray diagnosis after two examinations is less than 50 per cent reliable It is thus seen that the greatest value of the x-ray lies in the finding of positive roentgenologic signs and this result may be obtained in about 80 per cent of all cases of enteritis

The criteria for a positive x-ray diagnosis

are anatomic and physiologic Actual demonstration of the ulcers is technically difficult and can be made in only very few cases The physiologic features include those produced locally at the ulcer-bearing area and contributory factors The local signs include a failure of the involved area to fill or fill well, resulting in a "spastic filling defect," increased irritability, spasm and rapid emptying Contributory signs include a generalized hypermotility, rapid emptying of the entire bowel, ileal stasis and gastric retention

Cases presenting suspicious symptoms over a long period of time may show only a dilated, atonic cecum, which may present a typical spastic picture at a later examination Such cases should be regarded as quiescent rather than healed, for pneumoperitoneum may change a deformed cecum to a dilated one in the course of a few days

Suspicious roentgenologic cases are often cleared up by a diagnostic pneumoperitoneum One or two inflations, in a case presenting suspicious symptoms and suspicious roentgenology often makes the diagnosis If such a case is not due to enteritis no change occurs, but if due to enteritis the symptoms are quickly minimized and the x-ray picture changes completely and assumes normal aspects

Differential Diagnosis Ulcerative enteritis may simulate peptic ulcer, gall-bladder disease, or any other disease of the digestive tract On the other hand, pelvic disease, renal disease, the neuroses, pleural effusion, dyspepsias and postphrenicotomy dyspepsias may simulate enteritis and must be taken into consideration in the diagnosis X-ray studies can rule out the neuroses, malignancy, mucous and spastic colitis, hyperthyroidism, allergic dyspepsias and pleural effusion Amoebic dysentery must be ruled out by stool studies Non-specific colitis may resemble the tuberculous form, but usually occurs in the distal colon Whenever appendicitis is suspected in a case of pulmonary tuberculosis always rule out enteritis Very rarely does appendicitis produce localized spastic defects in the cecum or colon and when one has tenderness in the right lower quadrant, with or without leucocytosis and with a normal roentgenologic cecum, one may diagnose appendicitis Abdominal adhesions may sim-

ulate the tuberculous picture and their diagnosis depends usually upon a careful history and, if necessary, laparotomy *

Summary

Ulcerative intestinal tuberculosis is always a complication of pulmonary disease occurring usually in far-advanced cases with cavity and positive sputum. Although most cases show a classical symptomatology, yet many other diseases resemble it and no one group of symptoms is pathognomonic. Laboratory aids and physical examination are of little help in diagnosis. The x-ray is, at the present time, our best means of diagnosis, and positive x-ray findings may be obtained in 80 per cent

* *Editor's note* Abdominal adhesions may very often be demonstrated by x-ray after pneumoperitoneum is established

of all cases of enteritis. A positive diagnosis is correct in over 95 per cent of cases, a negative one with highly suggestive symptoms is only 30 per cent reliable, and a suspicious one is less than 50 per cent reliable. The diagnosis in suspicious x-ray cases may be cleared up with diagnostic pneumoperitoneum. A group of about 20 per cent of enteritis cases presents normal x-ray findings and in these a careful history and therapeutic pneumoperitoneum will usually clear up the diagnosis.

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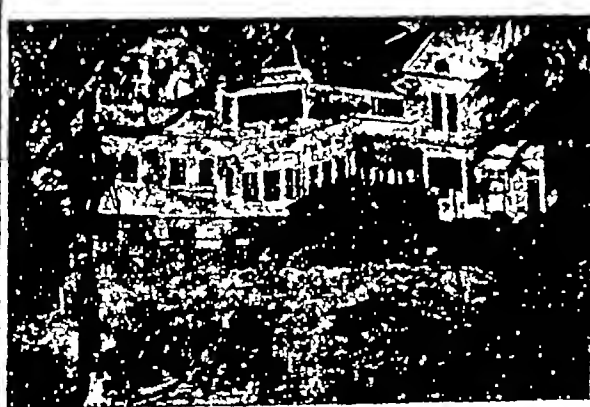
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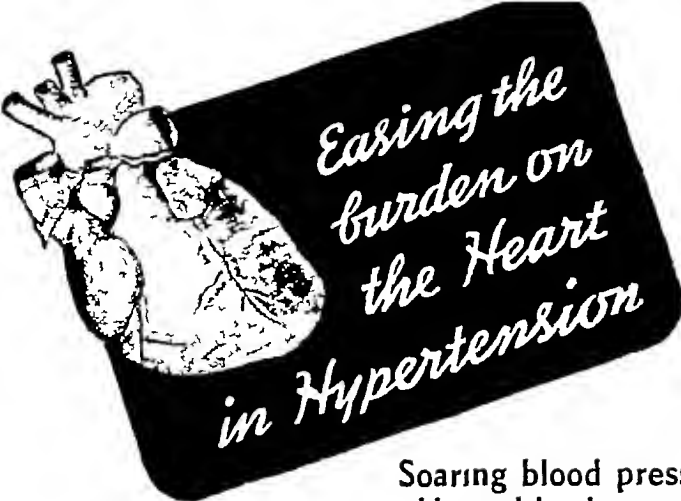
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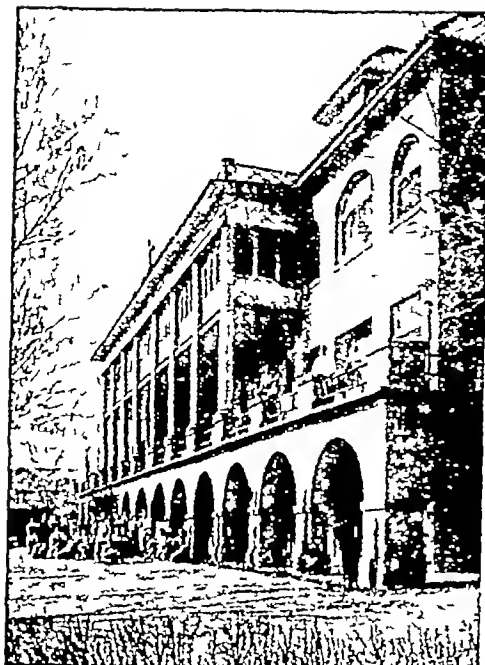
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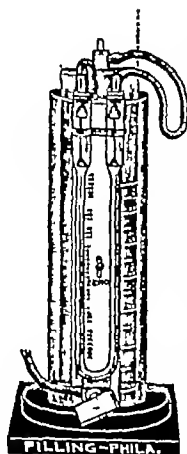
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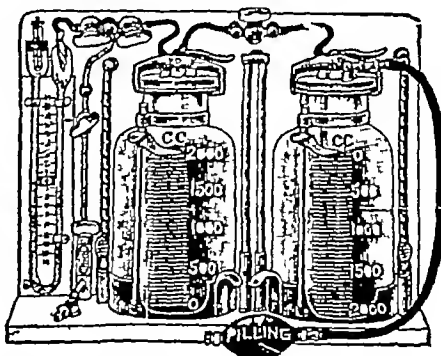
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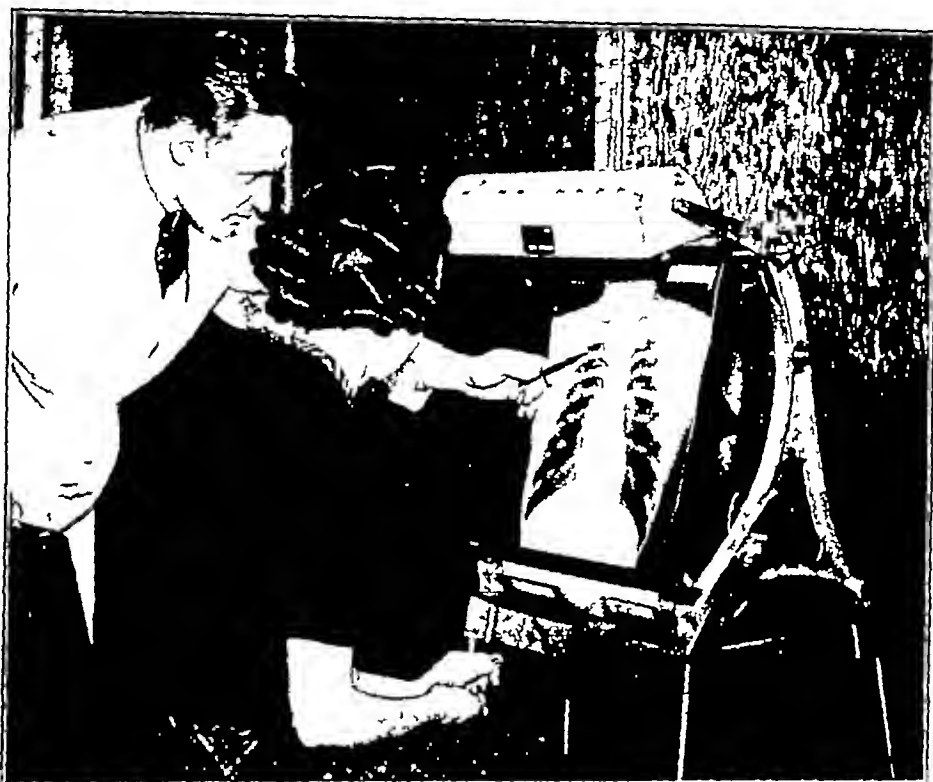
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Editorial Comment

Our Great Opportunity

For years a National crusade against tuberculosis has been conducted This crusade must

go on Authorities have long felt that in order to accomplish the ultimate, millions of our citizens should be x-rayed, so that the discovery of early cases might be accomplished and treatment instituted, and that previously undiscovered, active cases be diagnosed, isolated and placed under proper treatment

Our great opportunity now comes with the National Defense Program Within the next few years millions of our young men will be inducted into the Military and Naval services It is planned and hoped that every precaution will be taken to eliminate tuberculosis from our armed forces With this in mind, the American College of Chest Physicians appointed a Military Affairs Committee This committee completed a survey of the chest specialists of this country The results of the survey are now in the hands of the Surgeon General of the Navy and of the Army This committee also submitted a suggested plan for the rapid and efficient examination of chests including x-ray

Briefly, this suggested plan is as follows

1 All officers and men of the Navy, Army

and Marine Corps, as well as all who may be inducted into the service, be examined by x-ray

2 Every officer and man to be x-rayed upon discharge from the service

3 That a brief, but essential history be taken of each officer and recruit

4 That the x-ray film made upon induction into the service and the one made on discharge, together with the history, be made available to the United States Veterans Bureau as early as feasible

5 That all recruits found to have tuberculosis at the preliminary examination be referred to the proper health authorities in their home communities

6 That a physical examination be made of each officer and recruit

7 That a sound-proof or semi-sound-proof booth be provided for such examination

8 That the type of x-ray unit employed afford all the facilities for rapid work

9 That the type of x-ray film be the same for all government services, thus providing for uniform records

10 That the size of the x-ray film be such that chance for error will be reduced to a minimum

11 That the evaluation of x-ray plates be

made by medical officers known to be proficient radiologists. It is essential that these officers recognize minimal lesions, and at the same time will not read positive findings into the x-ray picture when not present. Great harm can come both to the armed forces and individual recruit if inefficient evaluation of chest films is not guarded against.

12 That a definite technic procedure be adopted in order that uniformity of the density of plates be accomplished.

13 This committee discussed at some length the x-ray procedure in the mass survey, in which it was suggested that the first medical procedure at the reception center be the filming of the recruit and that facilities be provided in order that the developing and drying of the film be expedited so that the evaluation of the film can be made at the end of the passage of the recruit through the medical team.

Not only the welfare of the armed forces is at stake in such a survey, but the general public and U S Veterans Bureau should be considered in the perfection of the plan. There will, no doubt, be thousands rejected from the military service because of tuberculosis. These thousands then should be followed up by the proper public health authorities.

The enormous cost entailed since the World War for compensation and medical care and hospitalization of veterans due to tuberculosis has made it plain that a chest x-ray must be a routine part of the health examination in order to discover the unfit already in the service and to prevent the unfit from entering the service. It costs the United States Government about forty million dollars a year for tuberculosis among World War Veterans. For a fraction of one month's cost, every person in the service, and those to be inducted into the service could be x-rayed.

It is the hope of the Military Affairs Committee of the American College of Chest Physicians and of this journal that the proper authorities of the Army and the Navy, United States Public Health Service, and the United States Veterans Bureau will develop a coordinated plan whereby not only all departments concerned will benefit by this survey, but the welfare of the public at large will be considered from every angle.

C M H

You Can't Educate a Cow

You cannot educate a cow to avoid contact with and spreading of tuberculosis. Elimination of Bovine Tuberculosis was secured through the proper direction of huge sums of money spent in case finding, followed by proper handling of the infected.

The National Tuberculosis Association has led in the endeavor to stimulate a similar program throughout the United States in the attempt to eliminate Human Tuberculosis. One of their great handicaps in this work in the past has been the indifference of the vast majority of the Medical Profession.

The Organized Medical Profession is now trying to assist in this great and noble work. It can be of assistance in two ways: first, by advice and constructive criticism, second, by getting whole-heartedly behind the Christmas Seal Campaign in order to secure the huge amount of funds necessary to carry on the work of initiation of case finding along proper lines all over the United States.

If Organized Medicine is active in the first objective and inactive in the second, our sincerity is certainly open to question. Let us, therefore, in localities where our assistance is welcomed, have every doctor's office a Seal Sale Booth, and where that direct assistance is not yet desired, at least let every doctor's office be a place of Seal Sale Boost, with prominent display of Seal Sale posters and hearty endorsement to the Public of the Work for which the Seal Sale stands. F W B

Political Medicine

Political Medicine is so abhorrent to the intelligent Public and Professional groups, that it needs must be opposed. Opposition of words, however, will be unavailing, especially in the field of Tuberculosis Eradication. The time has come when every general practitioner or pediatricist should tuberculin test every child of pre-school age in his or her practice and when a positive reactor is found, the adult home contacts should be tuberculin tested and the positive reactors x-rayed.

Since the proven adequacy of the Tuberculin Patch Test, it is a simple matter for the doctor to apply the little adhesive plaster to a spot of skin that has been rubbed with ether, leave it on for two days, and then

(Continued to page 350)

Tuberculosis in the Childbearing Woman

ISABEL ROBERTS ROE, M.D.,* and SARAH I. MORRIS, M.D.**
Philadelphia, Pennsylvania

One of the most important phases of the tuberculosis problem is that encountered in pregnancy in the tuberculous woman. The truth of this statement is substantiated by four major points. The first is the high female mortality from the disease during the childbearing years. As seen in Table I, the number is almost twice that of those dying of tuberculosis in all the other groups combined.

The second point is that these women are important sources of infection, having a large circle of contact. We can postulate from accepted figures, between 190,000 and 200,000 women of childbearing age who have tuberculosis.

The third point is that the largest number of their most intimate contacts are children. Myers³⁰ states that by the age of 20, approximately 10 per cent of those with first infection type of tuberculosis acquired in infancy are ill or have died of tuberculosis.

The fourth point is the cost of these cases to the community. The estimated cost of one case is \$3000 to \$5000.^{33, 30}

In order that we may take steps to reduce this morbidity and mortality in women of childbearing age we must inquire into the factors which make this period especially fatal. Referring again to Table I, we see that approximately 45 per cent of the 19,881 deaths occur between 20 and 30 years of age. This group is beyond that adolescent period of growth which so many writers give as the reason for the increase in incidence of the disease, so that is not a factor. However, this decade represents the period of greatest reproductive activity.

The reproductive function as a predisposing factor in the high incidence of tuberculosis will be discussed first. That pregnancy and parturition profoundly affect all the vital organs, metabolism, and the endocrine balance, is recognized. It seems reasonable to assume that this strain would be far more severe on a constitution already trying to cope

with a tuberculous infection.

A search for statistics on the incidence of tuberculosis complicating pregnancy proves disappointing. For one thing, a busy obstetrical service does not permit the detailed and relatively expensive methods necessary for good case-finding. In the main, the incidence is reported in terms of those cases giving symptoms only during pregnancy, labor, or the puerperium. There has been little follow-up in the post-natal period.

Two hundred tuberculosis specialists in England and on the Continent agree that pregnancy does not benefit the tuberculous woman. Seventy-five per cent of them also agree that latent infections are activated, quiescent lesions lit up, and active foci made more active.²²

Arrested cases can be considered safe risks only if they are carefully watched during their pregnancy for signs of renewed activity of the disease. Latent cases with no symptoms and doubtful findings on x-ray have been found to be the poorest risks. This situation can be explained by the fact that the physician is not apt to become aware of the condition until too late. In the active cases it has been found that the mildly active fibroid type run relatively little risk, but those with unstable, exudative or caseous pneumonic lesions are subject to serious progression of their disease.

There is also a tendency for those showing a relationship between the onset of symptoms and their pregnancy to show more advanced type of lesions. There is a high incidence of hemoptoic onset in these cases.

The question of parity is a moot point. Some say it has no bearing on the prognosis.⁴¹ Others find that their young primipara are subject to rapid advance of their disease during pregnancy and that a multipara who has had four or five pregnancies in rapid succession is liable to die in the puerperium. The European phthisiologists quoted above declared that in healed tuberculosis one pregnancy is stood by 50 per cent, a second pregnancy aggravates the tuberculosis, and a third

* Philadelphia General Hospital

**Department of Preventive Medicine, Woman's Medical College of Pennsylvania

TABLE I
1936 Mortality Statistics for the U S Registration Area*

Age	All Causes	MALE DEATHS		All Causes	FEMALE DEATHS	
		Tuberculosis	% TB		Tuberculosis	% TB
All Ages	821,439	40,912	5 0	657,789	30,615	4 6
0- 5	89,441	1,046	1 0	69,386	936	1 0
5- 9	10,252	372	3 6	7,914	310	3 9
10-14	9,696	441	4 5	7,237	684	9 0
15-19	15,472	1,521	10 0	12,540	2,657	21 0
20-24	20,081	3,022	15 0	17,377	4,512	26 0
25-29	21,210	3,616	17 0	19,402	4,395	22 6
30-34	23,102	3,781	16 0	19,593	3,308	17 0
35-39	29,690	4,187	14 0	23,413	2,859	12 0
40-44	38,088	4,445	11 6	26,591	2,150	8 0
45-49	47,682	4,441	9 0	31,776	1,725	5 0
50-54	57,642	3,817	6 6	37,936	1,489	4 0
55-59	64,386	3,230	5 0	42,832	1,295	3 0
60-64	73,495	2,520	3 0	52,387	1,224	2 0
65-69	81,236	1,960	2 4	62,348	1,180	1 8
70-74	78,813	1,278	1 6	65,816	815	1 2
75-79	74,571	787	1 0	66,856	614	0 9
80-84	50,055	287	0 5	49,800	277	0 5
85-89	25,235	1,106	0 4	29,231	121	0 4
Over 90	10,407	20	0 2	14,859	29	0 2

* Compiled from figures furnished by the National Tuberculosis Association

pregnancy means death

Labor is a dangerous time for the tuberculous gravida. The rate of blood flow is increased, the respiration is deepened, and the intrathoracic pressure is increased by bearing down efforts with the glottis closed. Furthermore, the blood loss attendant on even a perfectly normal delivery can ill be spared. There is little agreement on the advisability of caesarian section in these cases. Those who favor it point out that it spares the parturient the exhaustion of labor and is the ideal procedure. Those who condemn it feel that it entails more shock to the patient than a labor which is made easy by liberal sedation in the first stage and forceps with local anesthesia in the second.

It is the puerperium, however, which is the most productive of exceedingly rapid breaking down of caseous deposits with pneumonic spread throughout the lungs or millary spread by the blood stream throughout the body. The theory⁹ has been advanced that the proteolytic ferment which causes the normal retrogressive changes in the uterus finds its way by the blood stream to the

lungs. By its liquifactive action there the pathological tissues are broken down and there is cavitation and spread of the infection.

Probably, the most important factors in the whole problem are prompt, accurate diagnosis and the type of treatment given. Elisele and Mason¹⁷ claim that from 10 to 60 per cent of cases are missed if only physical examination is used. Figures from many sources show that the usual clinic routine is very inadequate in case-finding methods.

Treatment of tuberculosis in pregnancy has run the gamut commonly seen in conditions for which we have no specific cure. The ancients considered pregnancy beneficial to the tuberculous woman and so the situation called for no special treatment. Feeling gradually changed until the pendulum had swung to the opposite extreme, and Schauta's radical dictum, "Pregnancy in a tuberculous woman calls for abortion," was the therapeutic guide. The watch-word today is, "Treat the lung and ignore the pregnancy."

Any discussion of the treatment of a disease should start with the preventive meas-

ures The prevention of tuberculosis in pregnancy must begin before the woman is married First of all, she should be advised not to marry until at least two years have elapsed after cure If already married, she should avoid pregnancy for at least three years after her case has been arrested

Once pregnancy is established, the curative phase of the treatment is begun If the patient is eligible for the group considered safe risks, she should be followed carefully by frequent inquiry as to symptoms, repeated physical examination, and x-ray She should have extra rest, sunshine, moderate exercise in the open air, protection against infection, and a high carbohydrate diet³⁰

The best therapy for active tuberculosis in pregnancy is the sanatorium Many physicians⁴⁶ engaged in this work feel that the woman should be delivered at the sanatorium so that there may be no break in the routine

Artificial pneumothorax has come to constitute an invaluable method of treatment It can be instituted at any point with practically no danger either to the patient or to the pregnancy Peters and Davenport³² report 60 per cent good results with tuberculosis which preceded the pregnancy and 40 per cent when it appeared at the beginning of, or during, pregnancy

There always arises the question of the advisability of abortion James²² lists the indications for abortion as follows (1) fever, (2) wasting, (3) many bacilli in the sputum, (4) hemoptysis and advancing consolidation, (5) tuberculosis with hyperemesis, and (6) laryngeal tuberculosis in early pregnancy As a generalization he adds that if there are increasing symptoms and findings after six weeks to three months of sanatorium care, then abort

Those who oppose abortion point out that the progress of the disease is not arrested by removing the pregnancy and that a higher mortality results from interference than would result if the pregnancy were allowed to proceed³⁵

The obstetrical treatment of these cases during labor must be especially well planned During the first stage, sedatives should be liberally used Care must be taken, however, not to prolong labor unduly in this way The second stage is best shortened by forceps,

using morphine, scopolamine, or a combination of the two as an anesthetic If this does not provide the necessary anesthesia, it has been suggested that nitrous oxide and oxygen are the least harmful of the supplementary drugs There are two additional points of major importance in labor even more careful asepsis and greater care in the prevention of blood loss Some specialists in the field claim that pneumothorax or pneumoperitoneum should be established prophylactically within 24 hours of delivery in all cases showing the least suspicion of activity of the tuberculous process

After considering all that can be done for the known case of tuberculosis complicating pregnancy, certain weak links in the life-saving chain immediately become obvious The first of these is the inefficiency of the usual prenatal examination in discovering this disease Probably, the main reason for this situation is the cost of the necessary tests However, routine Mantoux or patch tests should not be prohibitively expensive and, if the importance of the test were explained to the patient, it seems very likely that cooperation would be obtained To consolidate the knowledge gained by the tests, fluoroscopy is suggested rather than x-ray, mainly because it is cheaper X-rays and sputum tests are then indicated for those with suspicious findings on fluoroscopy

The second weak link in the chain is that the woman may not be in a position to accept the advice of the physician for the treatment of her disease The disease is found to be twice as prevalent among ward patients as private patients The less affluent are more needed at home and they are found to be reluctant to accept sanatorium care even though the expenses be borne by the state in public institutions The solution to this problem requires education of the patient and her family and the cooperation of the social service agency

The increasing responsibilities of the child-bearing years as a factor in the high incidence of tuberculosis is considered important by the majority of writers on the subject, but it is difficult to obtain statistics The years of highest mortality, 20 to 30, are those during which the girl assumes the work of managing a home and rearing of children

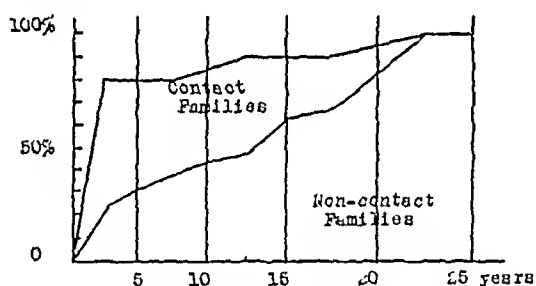
in crowded living quarters. This type of situation gives rise to all the factors which lower resistance to infection—long hours of work, insufficient rest, inadequate food and worry. Under these conditions it is very likely that an endogenous focus might be reactivated or that exogenous infection might find fertile soil.

The childbearing woman as a source of infection to children cannot be overemphasized. Congenital tuberculosis is a relatively unimportant form of infection in infants because, although highly fatal when it occurs, it is rare. Price,³³ in October, 1937, found only 100 cases in the literature, of which but 61 were adequately proved.

Graphs I and II indicate the importance, especially in the early years, of a contact in the family for the production of the sensitivity reaction and lesions to be found on x-ray.

GRAPH I

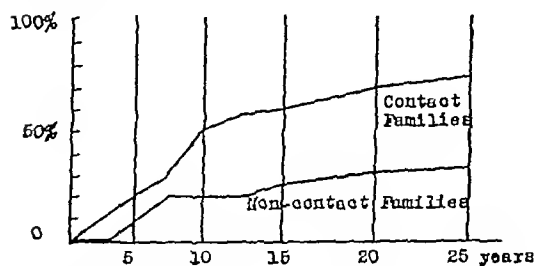
Percentage of Positive Tuberculin Reactions



Opie and McPhedran, *Am Rev Tuberc*, 14
347, 1926

GRAPH II

Percentage of Lesions found on x-ray



Opie and McPhedran, *Am Rev Tuberc*, 14
347, 1926

Eggers and Raffo¹⁶ in their study of 207 cases of children of tuberculous mothers clearly show the high incidence of premature births. In their series, 73 were premature,

representing more than 35 per cent of the total.

The harm resulting from continued contact with a tuberculous mother is brought out by Bralley⁸ who conducted a study of 223 children, 91 white and 132 colored, extending over a period of more than seven years. Her figures show that the first year in the infected is the most dangerous in both races.

Rosenberg and Kereszturi³⁴ studied 348 infants infected with tuberculosis in the first five years of life, and watched them for periods ranging from one to nine years. The total death rate was 91 per cent. Of those with x-rays, 289 per cent had parenchymal lesions. Of 175 infected in the first year, the death rate was 148 per cent. Of 59 infected in the first half of the second year, the rate was 102 per cent. The highest death rate, 437 per cent, occurred in those infected in the first three months of life. Of those who died, 562 per cent died in the first year, 281 per cent in the second year, and 157 per cent in the third year.

Until vaccination with BCG or some similar preparation proves more convincingly successful, the only treatment for the child of the tuberculous mother is separation from the source of infection. The effectiveness of this procedure is brought out in several experiments conducted in France and one in Chile. Duthoit and DuBois¹⁴ had absolute control over 138 children born of parents, who were tuberculous at the time of the children's birth. None of the 115 children removed at birth contracted any form of tuberculosis, whereas of the 23 with a variable history of contact, four died of tuberculosis and two developed the first infection type of the disease.

Cohen¹¹ reports the fate of 719 children in 175 tuberculous families. Of 323 taken away from the mother, all remained well. Of the 396 who remained with the mother, 238, or 60 per cent, developed tuberculosis.

Flick, of Philadelphia, considered childbearing so fatal to a tuberculous woman that he said, "Many a tuberculous bride lays aside her wedding dress for a shroud."

There are two important angles of approach in the solution of this problem. The first should be the education of the profession in the importance of using the best possible

case-finding methods We cannot afford to rely on a history of contact for a lead The material for the Mantoux test is hard to handle for the single patients of the private practice, but the patch test material is put up in plasters which are ready for application

The profession must realize the superlative importance of early diagnosis A delay in diagnosis during pregnancy may mean death to a young woman or, at best, a more protracted period of illness at a time when she is most needed at home

However promptly the doctor makes the diagnosis, his hands are tied if his patient has not been educated to the dangers of her position Women must be taught that tuberculosis in the childbearing years is an emergency To ask a mother to give up her newborn child or to leave her little ones to the care of others is heroic treatment But it seems likely that she might be consoled in some measure if she knew that they were being spared by her sacrifice

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Traumatic Chylothorax^{*}

Case Report and a New Suggestion for Treatment

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The thoracic duct has no function other than to transmit chyle from the abdomen to the vessels in the neck, and a disturbance in this function is manifested clinically by the accumulation of chyle in the pleural or abdominal cavities, or sometimes in both. Such disturbances in function may be brought about either by injury to the duct or obstruction of it, the latter being due either to pressure from without, or invasion of the wall by a malignant growth.

Since the duct is very deeply situated, and intimately associated with vital structures throughout its entire length, wounds involving the duct are usually rapidly fatal. It is not surprising, therefore, that in the world literature only about fifty case histories of traumatic chylothorax are on record. In many of these, automobile accidents were the cause of injury, in some cases, knife stabs, and in eight cases, the injury was due to bullet wounds. Owing to the extreme rarity of chylothorax from any cause, most of the cases have not been recognized early, many of them have been diagnosed as empyema and tube drainage instituted. This has probably contributed to the very high mortality which in this entire group is over fifty per cent.

The symptoms are usually slight for a period of three to seven days following the injury, then the patient goes into collapse,

characterized by dyspnea and a fall in blood pressure so that no radial pulse can be felt. Removal of the fluid results in a most dramatic relief of all the symptoms and within a few minutes the patient is apparently well again. As the fluid reaccumulates this chain of symptoms may be repeated again and again. Death may occur during this period from shock, but usually occurs much later from cachexia and exhaustion probably incident to the loss of chyle from the body.

A study of the literature on this condition soon convinces one that the various types of treatment recommended have never been satisfactory, or on a very rational basis. In most of the cases the fluid has been tapped at intervals to relieve the pressure. In some cases, a low fat diet has been used and some have advised restriction of liquid intake, but neither of these measures seems to have influenced the condition. In two cases, the aspirated chyle has been reinjected into the patient's vein, in one of these the patient died, and in the other the outcome was satisfactory.

Chylothorax due to a bullet wound must be considered as of extreme rarity since only eight cases can be found reported in the literature. The last case was reported in 1936 by Abraham Strauss⁶ who reviewed the other seven cases in considerable detail. The mortality in these cases was twenty-five per cent. We are reporting one such case, both because of the extreme rarity of the condition and because a type of treatment was used in this case which has not hitherto been used.

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or suggested in the treatment of traumatic chylothorax.

Case Report

A white male, 21 years of age, was shot in the chest with a .32 caliber pistol on November 11, 1939 at 1 30 a m. He was first seen by a physician at 4 30 a m the same morning. When admitted to the hospital at 5 40 a m he was in a state of profound shock and bathed in a cold perspiration, temperature 96°, pulse 120 and scarcely perceptible, respirations 32, groaning and labored in character. The wound of entrance was situated just below and medial to the right nipple and the bullet was lodged posteriorly in the left mid-scapular line at the level of the 6th interspace where it could be felt just beneath the skin. The lung fields were resonant throughout, x-rays of the chest showed normal lung fields, and the bullet was visualized in the location described. The abdomen was soft. 1000 c c of glucose in saline were administered intravenously. His general condition improved somewhat during the day.

On the following day, the patient began to have increasing respiratory difficulty and the respirations rose to 40-45 per minute, although the pulse remained firm and strong. The temperature was running around 99°. Percussion showed a developing dullness on the left side of the chest and at 12 30 p m an 18 gauge needle was inserted into the left hemithorax and 300 c c of pure blood were removed. This seemed to afford some respiratory relief and at the same time the bullet was removed from beneath the skin with novocaine anesthesia. At 6 30 p m he was transfused with 500 c c of citrated blood.

On November 13th he looked very ill and was extremely restless, requiring morphia. The temperature was running around 101°, pulse 140, respirations 48. The left hemithorax was aspirated and 1750 c c of bloody fluid obtained. Within three hours, the respirations had fallen from 48 to 29 per minute.

On November 14th at 1 00 a m he became very dyspneic and cyanotic and the abdomen was considerably distended, respirations were labored, shallow and very noisy. The pulse was fair only, and the patient was very restless and quite irrational. 500 c c of bloody fluid were removed from the left chest, which

seemed to be the total amount present. However, this procedure gave very little relief. A nasal tube was passed into the stomach and about 300 c c of dark colored fluid were removed. He was placed in an oxygen tent, coramine and prostigmine were given and large doses of morphine. A return flow enema was started for flatus in the intestines, and glucose was administered intravenously.

On November 15th, the patient seemed improved until 10 00 a m when he again passed into shock with a very weak, rapid pulse. X-rays of the chest made at this time showed a massive collapse of the right lung with pneumothorax—no fluid was seen in the left side of the chest. The patient was considerably improved by that evening.

On November 17th, 600 c c of blood were given the patient and he seemed considerably improved.

On November 19th, he was seen by Dr Robert E. Joseph of Salem, Oregon. At his suggestion, 750 c c of air were removed from the right chest which resulted in marked improvement in his respiration.

On November 20th, another 350 c c of air were removed from the right chest along with some very dark blood. This again resulted in great respiratory improvement.

On November 23rd, x-rays showed a large accumulation of fluid in the right chest and 1650 c c of this were removed. This fluid seemed partly serous and partly bloody and did not represent the entire amount present. No air was instilled into the chest.

From then on the right side was tapped frequently, and by December 24th a total of 18,290 c c of fluid had been removed. Examination of this fluid showed it to be chyle. The fluid at first was bloody and serous, it gradually became clear, and at the last was milky in appearance. It was always sterile on culture.

A summary of the aspirations from the right side of the chest up to this time is as follows:

November

- 23rd—1650 c c of bloody fluid
- 24th— 890 c c of dark brown fluid
- 25th—1800 c c of dark brown fluid
- 26th— 900 c c of chocolate colored fluid
- 27th— 650 c c of chocolate colored fluid
- 29th— 780 c c of dark colored fluid

December

- 2nd— 850 c c of creamy fluid
- 5th— 850 c c of creamy fluid
- 9th—1600 c c of creamy fluid
- 12th—1320 c c of creamy colored fluid
- 16th—1620 c c of creamy colored fluid
- 20th—1750 c c of creamy colored fluid
- 24th— 930 c c of creamy colored fluid

On December 26th he was transferred to our service in Portland. Over six feet tall and weighing 128 lbs., he presented a picture of great emaciation. The skin was flabby and dry and the normal muscle tone completely gone, but there was no embarrassment of his respirations and little distress of any kind. Temperature ranged to 99° and pulse to 100. Radiographs showed a pneumothorax on the right side with a 50 per cent collapse of the lung and a fluid level to the 1st inter-space anteriorly.

From favorable past experience in the closure of small bronchopleural fistulae with gomenol and mineral oil, it was decided to try this same method of treatment in this case. Injections were begun with 1 per cent gomenol in oil, starting with 1 c c and increasing it to 10 c c. The schedule of aspirations and oil injections from this date on is as follows:

December

- 29th—1 c c 1% gomenol

January

- 1st—3 c c 1% gomenol
- 5th—5 c c 1% gomenol
- 8th—5 c c 1% gomenol
- 10th—6 c c 1% gomenol
- 12th—aspiration 100 c c chyloid fluid
5 c c 1% gomenol
- 15th—aspiration 1500 c c chyloid fluid
- 19th—10 c c 1% gomenol
- 23rd—aspiration 2200 c c
10 c c 1% gomenol
- 31st—10 c c 1% gomenol

February

- 15th—aspiration 300 c c
- 26th—aspiration 50 c c serous exudate
—clear
aspiration 225 c c air—final intra-
pleural pressures —5 —6

By the middle of March, the lung was fully re-expanded, and he weighed 152 lbs. By April 15th, he weighed 160 lbs and was discharged perfectly well.

The recorded cases of traumatic chylothorax tend to assume a definite pattern. Following the initial symptoms, which may be slight or severe, the patient's condition is generally considered satisfactory for a period of three days or more. Chyle then begins to accumulate fairly rapidly in the affected hemithorax, and if its presence is detected early and it is removed from time to time no alarming symptoms may occur. Usually, however, its development is insidious and unnoticed until symptoms of shock suddenly appear, and the search for the cause reveals a large amount of fluid in the chest.

This characteristic period of latency has led to the assumption by Strauss that the bullet probably does not actually hit the duct, but that necrosis occurs along the bullet's path and a sloughing takes place in the wall of the duct allowing the chyle to gain access to the pleural cavity.

In our case, the bullet evidently perforated the left pleura and blood accumulated in the left side of the chest soon after. The initial symptoms were very severe due to the left hemothorax and shock. Aspiration of this blood on the two days following injury caused marked relief of the respiratory distress. On the following day, however, the patient was cyanotic and his condition was very critical, but aspiration of 500 c c of blood, which seemed to be the total amount, did not give much relief. Presumably, the pneumothorax which was found in the right chest on the following day was already developing.

Had the bullet actually perforated the right pleura, a pneumothorax would have developed at the time rather than three days later. We feel that this fact tends to substantiate Strauss' theory and that necrosis along the bullet tract actually took place. No fluid was noticed in the right chest until November 23rd, i.e., twelve days after the accident. This also can only be explained by a late necrosis of the duct wall, rather than by actual perforation at the time.

Following the development of the chylothorax the case assumed and followed the general pattern of other similar cases reported.

On December 28th the fluid was examined. It had a specific gravity of 1.017 and an acid reaction of Ph 5.0. The microscopic examina-

tion showed no cellular material Gram stained preparations showed no bacteria The fat content was found to be negligible

In view of the unusual opportunity afforded for the analysis of human chyle the Biochemistry Department of the University of Oregon Medical School made a very extensive analysis which is herewith reported for its scientific value rather than because of any clinical help which it supplied

Substance	Percent
Water	92
Solids	8
Total fat	1.3
Total protein	4.73
(Globulin	1.01
(Albumin	3.72
(Fibrinogen—too low to determine	
Sugar	35 mg
Urea nitrogen	12.5 mg
Non-protein nitrogen	20 mg
Cholesterol	96 mg
Uric acid	2.3 mg
Phosphatase	10.2 Bodansky units
Chlorides—calculated as NaCl	400 mg %
Inorganic phosphorus	10.6 mg
Calcium	7.5 mg
Sodium	258 mg
Potassium	9.8 mg
Magnesium	3.6 mg
pH	7.42
Carbon dioxide combining capacity at 40 mm CO ₂ pressure	60.4 vols %
Specific gravity	0.967 at 19° C
Freezing point	625°
Red blood cells	400,000
White blood cells	400
Orthotolidine test for blood	Positive

Comments on the composition of chyle removed from thoracic cavity

Since this material accumulated in the chest over a period of several days, its composition was undoubtedly changed somewhat by the transfer of material by diffusion into and out of the cavity

The water and solid contents were about the same as in plasma

The Ph and CO₂ combining capacity were within normal limits for plasma

Freezing point was about the same as is normally found in plasma and indicates that the chyle was isotonic with normal blood

The protein content was lower and the albumin-globulin ratio was higher than normally found in blood plasma

Very little fibrinogen was present

The sugar content was very low as compared with that of normal plasma This may have been due to the removal of sugar from the fluid while it was stored in the thoracic cavity

The following were lower than normally found in plasma—non-protein nitrogen, cholesterol, chloride, calcium, sodium and potassium

The following were found in higher percentages than normally found in blood plasma—fats, inorganic phosphorus and magnesium It is probable that the phosphate phosphorus largely rose from hydrolysis of phosphate esters while the material was in the chest cavity

Urea and uric acid were within normal plasma limits

Summary

A case is reported of chylothorax due to bullet injury This is apparently the ninth such case reported A new method of treatment was tried in this case, with recovery A brief review of the salient features of chylothorax is presented and a complete chemical analysis of human chyle

Conclusions

The use of gomenol and oil in the treatment of traumatic chylothorax would seem to be worthy of trial on the basis of its success in this one case The development of chylothorax is probably due to a necrosis along the bullet path rather than to a direct injury of the thoracic duct

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Chronic Pulmonary Diseases from the Insurance Point of View

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If your practice consists of any considerable number of patients with chronic pulmonary disease, you will find that some cases involve insurance in one or more of its complicated forms. In the time at our disposal we must limit our discussion and, therefore, we will not consider casualty, sickness, health and accident insurance, compensation carriers or the like, nor their problems and methods. They also, at times, may disturb the peace and quiet of your practice, but to-day let us curtail our subject to Life Insurance Companies—their problems and yours.

Most large companies have been mutualized. This means that the policyholders are the owners of the company—in the last analysis are the company itself. Gains, if any, accrue to the policyholder in the form of dividends. Losses are reflected in these same dividends.

Some years ago, Life Insurance Companies incorporated into life insurance contracts a disability clause, offering to the insured the added protection of benefits in event of disabling disease. The original clauses covered total and permanent disability. Later, the total and presumably permanent or so-called temporary clause was introduced. Partial disability is usually not covered except in specific instances.

Total disability may be defined as the inability of the individual to do gainful work in his own or any other occupation.

Total and permanent disability in an insurance contract was intended to mean just what it says and a very nominal charge was

made for this additional protection. Benefits were available under this clause, if disability rendered the insured incapacitated for the remainder of his lifetime in his own or any other occupation.

With the passage of time, many companies voluntarily liberalized this definition and accepted an obviously prolonged disability as a permanent one. For example, a totally disabled tuberculous patient who has been disabled for one or two years with an eventual favorable prognosis in a year or two hence might receive favorable consideration under the above clause.

Total and presumably permanent disability is a total disability which has existed continuously for a definite period, such as ninety days, four months, or six months, permanency being assumed at the expiration of the specified period even though recovery is anticipated.

This covers briefly the more important disability clauses. The usual benefits available are as follows:

(1) *Waiver of premium* consists of a waiver of premiums during the course of approved disability, the face amount of insurance payable at death is unaffected.

(2) *Waiver of premiums plus payment of the face amount of the insurance in monthly installments at the rate of approximately one per cent (about \$10.00 per \$1,000) per month of the face amount of insurance.* In event of recovery the face amount of the original insurance is reduced by the amount of payments received by the policyholder. These

policies pay themselves out over a ten year period

(3) *Waiver of premiums plus income payment* is the next type to be considered. The amount of original insurance is not affected in event of death in this so-called "Income Policy With Waiver of Premiums." Some income policies provided benefits in event of total and permanent disability, others, in the event of total and presumably permanent (or what is known as temporary) disability as previously defined. These policies are no longer available under the original liberal terms because companies have been so imposed upon by questionable claims with no merit or claims, never intended to be compensable in the policy coverage. Many reputable physicians have become a party to such claims in their effort to aid their patients and, as a result, the public has been deprived of one of the best forms of disability coverage.

Controversy will arise in connection with fraudulent claims. On the other hand, an honest difference of opinion may occur in borderline cases between partial and total disability.

There may be a difference of opinion as to what constitutes total disability, and, likewise, as to the interpretation of permanency. Recovery from a permanent disability is a fertile field for honest difference of expert opinion. Controversy may also arise if a claimant with a partial disability attempts to prove a state of total disability prior to age sixty, an age at which some features of disability clauses become modified.

It is when these controversies arise that the consultant and particularly the specialist in chest diseases may become exposed to numerous pitfalls, some of which I wish to mention today.

Subacute and chronic diseases constitute most of life insurance disability claims. One of the largest companies has approximately 35,000 disability claims, of these 20 to 25 per cent are due to diseases of the respiratory system, mostly pulmonary tuberculosis (8,000 to 9,000).

Smaller but difficult groups in which to evaluate disability are asthmatics with periods of partial total disability followed by remissions, silicosis with its often meagre

symptomatology and extensive pathology, and lung tumors (not likely to give rise to a difference of opinion as to disability once the diagnosis is established).

Insurance companies may have a dual interest in pulmonary tuberculosis (1) that of an employer, (2) that of an insurer.

These interests are not common to each other. As an employer the Company may have a tuberculosis program which consists of two separate but interrelated divisions, the one might be called the social aspect, and the other, the welfare aspect.

A phase common to both of the above divisions would be case finding, with examinations of contacts and future close observation of this group and pre-employment examinations including chest films. Such examinations not only keep down the tuberculosis incidence among the employees, but are a prophylactic procedure against unnecessary exposure of fellow associates. Pre-employment chest x-rays may be limited to Home Office employees, because facilities for such an examination are readily available whereas this procedure might not be practical in a widely diversified and scattered field group.

As elsewhere, case finding may take an active or passive form. The Company Infirmary may pick up a stray case, or examination of contacts may result in the discovery of others. A more active approach is the routine x-raying of chests in an entire department. Close observation of minor frequent illness will from time to time reveal a field case although these are usually diagnosed by attending physicians.

The Welfare Division of a company program includes the treatment and rehabilitation of employees who have been or are suffering from tuberculosis and here you have a vital interest. Some organizations grant financial assistance to their employees suffering from tuberculosis. Most companies make every effort to discourage home treatment unless the case is under the care of a competent specialist. Usually, care is provided at Company expense within certain limits at an acceptable institution. It is during the interval between institutionalization and rehabilitation that you may be requested to take the patient under your care. The problem then will be to determine when it is considered

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advisable for the patient to return to his duties, assuming of course that the patient is to be re-employed. In some instances, arrangements can be made to place the patient on part time duty or light duty, in other instances, especially in agency work, it may be a full time competitive job. The productive end of a business cannot be handicapped to any great extent, and if concession to light duties is not made you may assume it is for a good reason.

The magnitude of the tuberculosis problem in such a program is comparatively small compared to the larger disability claim problem. Your relationship to the former has a patient physician status, with the Company standing by as a guardian interested in the welfare of the patient as far as it is per-

mitted to do so within the company plan. The following tables from one of the large insurance companies will give a good cross section of the Company Tuberculosis Problem.

CENSUS

Year	Home Office	Field	Total
1930	9,123	30,687	39,810
1931	9,237	30,513	39,750
1932	9,619	29,771	39,390
1933	10,091	29,714	39,805
1934	10,430	29,362	39,792
1935	10,403	29,208	39,611
1936	10,314	29,085	39,379
1937	10,649	28,851	39,500
1938	11,437	28,628	40,065
1939	11,452	28,195	39,647

TUBERCULOSIS OCCURRENCE

As of Jan 1	New Cases Home Office	Percent	New Cases Field	Percent	Total	Percent
1930	15	0.16	83	0.27	98	0.25
1931	18	0.20	74	0.74	92	0.23
1932	18	0.19	44	0.15	62	0.16
1933	20	0.20	40	0.14	60	0.15
1934	20	0.19	33	0.11	53	0.13
1935	16	0.15	33	0.11	49	0.12
1936	13	0.13	28	0.10	41	0.10
1937	15	0.14	13	0.25	28	0.07
1938	13	0.11	17	0.06	30	0.08
1939	12	0.11	18	0.06	30	0.08

CASES TERMINATED DURING YEAR

Year	Death	Arrested	Various	Total
1930	15	36	12	63
1931	14	30	24	68
1932	10	39	17	66
1933	11	40	10	61
1934	5	54	23	82
1935	8	51	18	77
1936	6	30	10	46
1937	10	24	7	41
1938	4	18	10	32
1939	11	28*	5**	44

* Of this number, 25 returned to active duty, 3 were not re-employed.

**Of this number, 1 was retired on pension, 1 maximum allowance reached, 2 married, 1 resigned.

Insurance companies and chest specialists are constantly confronted with the major problem of chronic chest diseases in connection with disability claims. Data regarding diagnosis, treatment, and prognosis is important whether it concerns the patient as such, or, as an insurance disability problem.

The component parts of a diagnosis are history, which includes symptoms, and examination, which may involve special examinations and many contributory tests. Diagnosis is the logical end result or conclusion reached after evaluating the history, considering the symptoms, and examining the patient. The relative importance of the component parts of a diagnosis assume a different, or, shall I say, an abnormal relationship to each other when disability is involved. A patient usually consults or is referred to

a doctor for advice concerning an illness, and, if this be the only motive, the history will be reasonably truthful and if insurance is involved it is incidental

Details as to the exact date of onset of illness may be the determining factor as to the validity of a claim, whereas, the approximate date of onset of illness may have seemed sufficient at the time the history was recorded

For example, a policy provision may have lapsed at noon on May 1st. Did the sudden hemorrhage, the first indication that the patient was ill, occur on May 2nd, or do your notes simply state "early in May"? The fact that the disease must necessarily have been present prior to the above date is not in point if the insured was working (gainfully employed) up to the time of this hemorrhage. Existence of disease does not presuppose existence of disability. Here is a note taken from a recent file illustrating the point: "There have been no outward signs of disability, such as loss of weight, etc. In fact, had not the hemorrhage occurred on May 26, 1940, it is quite likely she would have continued to work for some time without consulting a physician."

The above demonstrates that the exact date of termination of employment is not necessarily identical with the date of onset of illness. The date of termination of employment may not have particularly interested the physician and the history will not be illuminating on this, the pivot on which a case may turn. Such data could in a few moments be recorded in any history, but it is the exception rather than the rule to find such specific information.

To say that a medical history is not intended as a source of information for insurance companies or courts begs the point and only leaves the impression of carelessness and remissness before a court.

These omissions or mistakes may not necessarily disappear with the burial of the patient, often much to the chagrin of even medical authorities.

Subjective disabling symptoms in the history must be judiciously weighed in relationship to objective findings. Whenever possible prove subjective symptoms objectively. If objective findings are entirely absent or negligible, and if the diagnosis is based on sub-

jective symptomatology or inconclusive evidence, then the conclusions drawn are not on a critical basis. Diagnosis should be determined whenever possible beyond any question of doubt. Future litigation may involve the question of diagnosis and testimony will be ineffective if the diagnosis be open to attack or question. Or, what is more embarrassing, it may give opportunity for the assumption of another possible diagnosis. Such eventualities may cast reflections on your competence, particularly so because you are rarely granted an occasion to justify your position. You may be obliged to rest your case on evidence that has already been presented by others.

Your diagnosis might have been made more conclusive by a simple test or two, a few additional notes, a more complete record, a concentrated sputum test, guinea pig inoculation or stomach lavage, or another x-ray which might have settled the questionable point.

The criteria for the diagnosis of pulmonary tuberculosis is well established, and of these, the symptomatology or its absence is the least important, because subjective evidence alone does not unquestionably make or eliminate the diagnosis.

A single x-ray may or may not be sufficient, but it is not infrequent for able specialists to disagree as to the interpretation of a single film. If controversy arises over a film each contestant will draw conclusions most favorable to himself.

While on the question of symptoms—dyspnea is a frequent disabling symptom presented in connection with disability claims—and often it is the only symptom offered in support of claim. The vital capacity index as suggested by Dr. George Ornstein is applicable providing the patient is cooperative. Vital capacities should probably be done by the nurse before the consultant sees the patient. The patient may be much more interested in demonstrating his physical fitness to the nurse than he will be later to the doctor whom he has assured of his inability to walk up a flight of stairs without stopping for a rest because of dyspnea. The doctor during the course of his examination can recheck the vital capacity and determine whether or not it compares favorably with the first read-

ing and this may also give him some idea whether or not the patient is cooperating

Circulatory time tests have been of some help but they are not the final answer. An insurance company is more likely to accept the disabling symptom of dyspnea if a low vital capacity is supported by marked circulatory time disturbances. We hopefully look forward to the test which will objectively and independently of the patient tell us whether or not the patient's dyspnea is real or assumed.

The patient who consults a doctor in anticipation of insurance benefits he hopes to receive or have continued may lead you into no end of trouble. He is likely to neglect to inform you about the insurance benefits and his history may be colored slightly or considerably to suit his particular purpose. Many a pulmonary hemorrhage had its inception in the imagination and not in the lung of the patient.

A doctor may, of course, be requested to examine a case in behalf of an insurance company or an attorney representing a policyholder. In either instance, the physician has had ample warning of the possibility of litigation and he can prepare himself accordingly. Under such circumstances the history again loses some of its usual value and the examiner must make every possible attempt to correlate the subjective findings with objective evidence. Many of these patients have had numerous examinations and may be well versed in the symptomatology of their disease. In these cases, particularly, you should guard yourself carefully.

Do not be led from the realm of facts and observations into that of speculation and wishful thinking.

Diagnostic Standards and Classification of Tuberculosis says "The attempt to demonstrate tubercle bacilli in the sputum from patients with pulmonary disease must never be omitted." But many, including some reputable institutions, seem to think the above means an occasional simple smear obtained at irregular intervals. In event of failure to demonstrate tubercle bacilli in a simple smear, the more refined procedures—concentration techniques, demonstration by cultural methods, or by animal inoculation—might yield the answer. Demonstration of tubercle bacilli in stomach washings either appears

to be a lost art or one still in the realms of research in spite of its acknowledged practical application. It cannot be argued that the cost of the above procedures are prohibitive because even when expense is not the paramount question we find the above studies are often not completed in spite of questionable diagnoses of pulmonary tuberculosis. The failure to have these more critical studies completed may arise to taunt you.

In regard to negative sputum where the more rigid standards can not be applied it is suggested that "A specimen of sputum should be called negative only when no bacilli are found on concentration. For apparently arrested at least one adequate specimen of sputum or gastric lavage must be negative once a month for three consecutive months. For arrested the same for six consecutive months. For apparently cured the requirements for arrested must be fulfilled, thereafter one specimen every three months must be negative for eighteen months. In addition, as stated previously, some specimens should be negative on culture and animal inoculation. It should be understood that in addition to these minimum requirements, any sputum specimen, unusual in amount or character should be examined." Likewise criteria for x-rays are well established. The failure to abide by accepted standards leads to confusion. If the standard criteria were universally used much uncertainty would be eliminated. As previously stated, funds or equipment may not always be available to permit a too rigid application of the rule, but more often indifference, lack of thoroughness, slipshod management, are responsible in many cases where cost is not the major item of consideration.

We are frequently expected to accept a problematic diagnosis when an exhaustive study might have established the status of the case. When negative sputums are reported we are rarely informed as to the technique used.

The more comprehensive studies above suggested may not be warranted if there is evidence of x-ray activity, but in the absence of unquestionable proof, the failure to carry out exhaustive studies which might have been done is the most common pitfall in the field.

of chronic chest diseases

Treatment is not the problem of an insurance carrier. Even in instances where helpful advice could be given, an insurance company must not go beyond its province. Not infrequently, however, a thorough study made on behalf of an insurance company in connection with a disability claim, not only establishes the diagnosis accurately, but also leads to the institution of proper treatment—that is, an endeavor is made to cooperate with the attending physician by complying with a request that he be furnished with the results of the study made by the independent specialist.

Prognosis is the big question mark in tuberculosis whether or not insurance is involved. Here opinions may honestly differ, and on prognosis may hinge the availability of benefits. Will the patient recover sufficiently to permit him to resume gainful occupation, and, if so, when? You should also consider the advisability of making reports of your examination directly to the insurance company without disclosing the contents to the patient. If the examination is made on behalf of a company, the claimant under no circumstances must be given unauthorized information.

Obviously, the early originators of the disability clause were not aware of the protean nature of tuberculosis. In some instances the questions asked by insurance companies cannot be answered. For example, in a moderately advanced case of exudative tuberculosis—Do you expect recovery and, if so, when? In the main, today, companies take a rather liberal attitude in their action on tuberculosis claims.

Arrest and recovery are not identical as all well know. As to when a patient may resume gainful occupation is another very difficult

problem. A physician is justified in assuming a conservative attitude on the question of rehabilitation, particularly so, if the patient has sufficient insurance or other income to make him economically independent. Companies parallel this in their conservative handling of this problem. We are all aware of the incidence of recurrence, but this does not mean because an individual has tuberculosis plus a liberal disability income that he is necessarily for the remainder of his lifetime an invalid as some would attempt to make us believe. Other patients develop a fear of recurrence and will not resume work even at the urging of their own physicians. It is wrong to permit these individuals to develop a tuberculous neurosis.

Companies will usually cooperate in a rehabilitation plan by continuing benefits while the recovered patient is "trying out his wings."

The gainfully employed female who develops tuberculosis, recovers, and marries is an ever recurring problem to all of us. Her occupation on recovery is that of a housewife, the duties those of taking care of a small apartment. She can conveniently rest a few hours at mid-day, whether or not such a rest is necessary. In any event she would have no earned income and available insurance benefits simply augment the budget. Furnishing supporting physicians' statements in cases of this type certainly approaches questionable practice. The patient should have every reasonable benefit of the doubt, but the physician should remember that some other policyholder who also has some rights eventually pays those benefits. The policyholders pay these claims and the company merely acts as the distributing agent.

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Newer Aspects of the Pneumoperitoneum Treatment of Pulmonary Tuberculosis

ANDREW L. BANYAI, M.D., F.A.C.C.P.*
Wauwatosa, Wisconsin

It was demonstrated in a series of roentgenologic studies¹ that there is a considerable shortening of the apicobasal diameter of the lung during pneumoperitoneum treatment. Following the injection of 500-1000 cc of air at the first treatment the maximum apicobasal relaxation of the lung was on inspiration 4.2 cm, on expiration 4.5 cm, after the fifth treatment 5.6 cm on inspiration and 3.6 cm on expiration, after the tenth treatment 5.1 cm on inspiration and 5.2 cm on expiration, and after the twenty-third treatment 7.3 cm on inspiration and 5.8 cm on expiration. These figures compare favorably with the elevation of the diaphragm after phrenic nerve block. I² studied a group of patients who had a surgical paralysis of the phrenic nerve and found that the maximum reduction of the apicobasal diameter of the lung was 6.3 cm, the relaxation was between 3 and 3.9 cm in one-third of the cases, and more than 4 cm in only 13.3 per cent.

Comparative measurements of the radiological chest volume before and after treatment that were reported in a previous communication³ revealed that the sustained use of artificial pneumoperitoneum treatment was capable of producing a reduction of the lung volume with the exception of relatively few cases in which extensive pleural adhesions prevented the rise of the diaphragm.

Complete rest of the lung cannot be established by pneumoperitoneum. This is not, however, a shortcoming of this treatment. It was shown in another study⁴ that immobilization of the lung cannot be accomplished by the most frequently used type (low tension) of artificial pneumothorax. When the respiratory expansion of the diseased portion of lung treated by pneumothorax was investigated the following findings were noted: (1) the motion of this area was less than that of the entire lung before treatment,

only 54.5 per cent, (2) the motion of these two areas was closely similar in 18.2 per cent, (3) the extent of the motion of the diseased area during treatment was greater than that of the entire lung before treatment in 27.3 per cent.

It was pointed out in a previous article² that the surgical paralysis of the phrenic nerve failed to secure pulmonary rest in 40 per cent of the cases. Artificial pneumoperitoneum, according to my observations, caused a decrease in the respiratory motion in 25.6 per cent, while the motion remained unchanged in 53.5 per cent, and increased in 20.8 per cent. Roentgenologic measurements show⁵ that during effective pneumoperitoneum treatment the maximum as well as the average decrease in the roentgenologic surface area of the lung and, presumably, a therapeutically satisfactory pulmonary relaxation, was greater than that found after surgical paralysis of the diaphragm.

The technique of artificial pneumoperitoneum is not difficult. I prefer to give the first injection three fingers' breadth below and to the left of the umbilicus. The site is prepared by tincture of iodine or mercuric iodine, and the skin and subcutaneous tissue are infiltrated with one per cent novocain. Then with a 19 gauge needle, introduced perpendicularly, the layers of the anterior abdominal wall, particularly the peritoneum, are anaesthetized. After the novocain has been injected, the plunger of the syringe is drawn outward in order to ascertain that the point of the needle is not lying in a blood vessel. By this preparatory injection one can estimate the thickness of the abdominal wall. By elevating a skin fold between the thumb and index finger a small skin incision is made to aid the smooth insertion of the Floyd needle. The handle-like head of this needle ensures a firm grasp and easy handling. Its obturator prevents its being obstructed by blood clots or tissue particles. If the needle is pushed only gently and it is passing through the tissues gradually, one can feel the resistance

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offered by the different layers of the abdominal wall. As a matter of routine, the needle is connected with a standard pneumothorax apparatus before it is inserted into the tissues. The danger of puncturing the intestines is remote. If the needle is slowly forced inward, the omentum and the intestines being soft, movable, and pliable are pushed in front of the needle but are not punctured.

At the first insertion of the needle the manometer registers neutral pressure (atmospheric or 0) in this part of the abdomen. Positive pressure appears usually after the injection of 300 to 400 cc of air. If the point of the needle does not reach the abdominal cavity, but is lying in the tissues, or if one is dealing with a case of adhesive peritonitis, the manometer registers a rather high positive pressure following the injection of 50 cc of air. At the same time the patient may indicate sudden, sharp pain at the site of the injection. Good indicators of a correctly performed injection are (1) the disappearance of the liver dullness and the detection of a tympanitic percussion note over the right hypochondriac region after the injection of 300 to 400 cc of air, and (2) the appearance of pain in the shoulder region. The latter is caused by the pressure of the injected air upon the diaphragm. The sensation is transmitted through the phrenic nerve to the cervical segment of the spinal cord and from there it radiates to the shoulder and neck through the nervus cutaneus colli and the three nervi supraclaviculares. To avoid apprehension it is a good policy to inform the patient of this eventuality. The right hypochondriac area can be easily percussed by "palm" percussion by the operator himself. A tympanitic percussion note over this region following the injection of more than 500 cc of air is absent only (1) in cases where the space between the liver and the lower surface of the diaphragm is obliterated by adhesions, (2) in cases where the air is injected into a pocket formed by adhesive peritonitis at or near the site of injection, and (3) in case of some technical error, such as leakage of tubes or valves, or the injection of air into the tissues of the abdominal wall. Additional technical details and observations were presented in previous articles.⁶

The most reliable criterion of a well performed artificial pneumoperitoneum is a roentgenologic examination with the patient in an upright position. Fluoroscopy or a roentgenogram reveals the presence of air in the subdiaphragmatic region. The area occupied by the injected air does not signify a corresponding upward displacement of the diaphragm, but it is partly made up by a ptosis of the liver, spleen, and the stomach.⁷

After from four to nine weeks' treatment the manometer registers a positive pressure when readings are taken prior to periodic injections.⁸ The refills are given once a week, or at 10 to 14 days intervals. The amount of air used for refills varies from 800 to 1500 cc. The interval, the amount of air, and the length of treatment should be adapted to the individual case and should be determined by frequent fluoroscopic studies, by periodic examinations and roentgenograms.

When pneumoperitoneum is well established, the subdiaphragmatic route can be used for the subsequent injections. The patient is placed in the same position as for artificial pneumothorax. A sandbag is placed under the lateral aspect of the chest. After proper preparation of the field, and local anaesthesia, a 2.5 inch-long needle, 19 gauge, without an obturator, is connected with the manometer of a pneumothorax apparatus and inserted about 2 to 3 cm above the costal margin. The needle must be passed rather deeply, otherwise, if the costophrenic reflection of the parietal pleura is too low, the point of the needle may enter the pleural space. Manometer readings may suggest that the air pocket of the pneumoperitoneum was reached. While under normal circumstances the pressure in the subdiaphragmatic area is negative (subatmospheric) and it oscillates correspondingly to the respiratory changes in the intrapleural pressure, it is positive in most cases of well established artificial pneumoperitoneum. In a well established pneumoperitoneum the manometer reading is more positive on inspiration and less positive on expiration, that is, the subdiaphragmatic pressure shows respiratory variations opposite to the intrapleural pressure. Because of the lesser thickness of the lower thoracic wall and because of its greater resistance, and also because larger amounts of air col-

lect underneath the diaphragm than in other parts of the abdomen, the refill injections are much easier and simpler by the subdiaphragmatic route than by the subumbilical route

Artificial pneumoperitoneum can be used in combination with the surgical paralysis of the phrenic nerve. It is of advantage to perform the phrenic nerve block first and follow it by pneumoperitoneum. Following a phrenic nerve block, the elevation of the diaphragm can be substantially increased by repeated intraperitoneal injections of air. This combined procedure is of value particularly in unilateral cases, and in instances where, in a patient with extensive bilateral tuberculosis, one lung shows satisfactory improvement on pneumoperitoneum treatment while the disease in the other lung remains stationary, or is getting worse.

Complications and hazards—When resorting to this treatment one must keep in mind the possibility of some complications, such as injury to the deep epigastric artery or mesenteric vessels causing hemorrhage, and peritoneal shock due to sudden distention of the abdomen. Fortunately, I have not encountered any of these in my experience with this procedure either in a large number of cases treated for their intestinal tuberculosis, or in patients treated for their pulmonary tuberculosis. A complication that was noted in several of my patients with long continued treatment was the development of a small or moderate peritoneal effusion. Its appearance may be asymptomatic and detected only by periodic physical and roentgenologic examinations. In some of these patients the development of the peritoneal effusion was accompanied by abdominal pain and discomfort, malaise and elevation of temperature. With the exception of few instances, the effusion did not interfere with the continuance of the treatment. One patient who had been treated for seven months developed a hernia as the result of the passage of some of the injected air into the scrotum. The swelling, the size of a fist, caused considerable localized pain, it gradually disappeared in about two weeks. No recurrence of this complication has been observed since then (eight months), although the injections have

been continued at regular intervals as before. We have seen mediastinal emphysema as a complication of artificial pneumoperitoneum in eight patients.⁹ Its onset is usually sudden and is associated with moderate to severe retrosternal pain, difficulty in coughing and expectorating, choking sensation, pain on swallowing, soreness in the neck, and pain in and about the larynx. In such cases, one can palpate the air in the deep tissues of the neck alongside the trachea and larynx, and the roentgenogram shows the presence of air along the mediastinal structures. One of our patients had an air embolism when a refill was attempted in a well established pneumoperitoneum. She made a complete recovery from the consequences of this accident, and is still receiving the treatment. Accidental death occurred in one of my patients in 1933. This patient had a thoracoplasty on the left side. Pneumoperitoneum treatments were given by the subdiaphragmatic route on the right ("good") side. Inadvertently, the needle caused a wide tear on the visceral pleura that led to a complete collapse of the "good" and only functioning lung, the patient died twelve hours later in spite of continuous efforts to save her life.

Indications—(1) when artificial pneumothorax is indicated but cannot be established because of pleural adhesions. In unilateral cases better results can be attained by pneumoperitoneum if it is preceded by a surgical paralysis of the phrenic nerve. (2) In addition to artificial pneumothorax in which the relaxation of the diseased basal portion of the lung is desirable but cannot be accomplished by pneumothorax alone. (3) When the tuberculous lesion is too extensive for bilateral pneumothorax. (4) When bilateral pneumothorax is disregarded because of the advanced age of the patient. (5) In bilateral pulmonary tuberculosis complicated by intestinal or peritoneal tuberculous lesions, or by basal bronchiectasis. (6) In addition to the surgical paralysis of the phrenic nerve when the sputum remains persistently positive and it is expected that closure of cavities and conversion of the sputum can be accomplished by an additional rise of the diaphragm.

Contraindications—(1) Generalized tuberculosis. (2) Amyloidosis. (3) Diseases of the

aorta and the coronary arteries (4) Cardiac decompensation (5) Plastic peritonitis with palpable masses

rather than to the limitations of the procedure

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Conclusions

(1) It has been demonstrated by roentgenologic studies that long continued artificial pneumoperitoneum treatment is capable of causing a relaxation of the lung and thus it creates mechanical and circulatory changes that are favorable for the healing of certain types of pulmonary tuberculosis

(2) This treatment should not be employed to the exclusion of other appropriate mechanical or general measures, but only as a therapeutic adjunct in cases which cannot be treated effectively by other methods

(3) It should be used according to the indications and contraindications described above

(4) Closure of cavities, conversion of positive sputum cases into negative ones, and healing of tuberculous infiltrations were observed

(5) Therapeutic failures were frequent with this treatment This fact, however, should not detract from its merits, because the majority of the failures were attributable to the far-advanced stage of the disease, the poor resistance and defense of the patient,

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Organization News

R E P O R T

Committee on Undergraduate Education in Medical Schools*

E W HAYES, MD, F.A.C.P.**
Monrovia, California

In rendering the report of your committee on Undergraduate Education in Medical Schools, I want to again call your attention to the reasons for the existence of this committee and to outline what the committee has accomplished up to the present time

Most of you who are here today know that one of the principal objectives of this organization is to bring about an improvement in the methods by which chronic diseases of the lungs are taught in the various medical schools of this country For the past four years this committee has been studying the means by which this subject is now being taught in our schools It has been the hope that as a result of this study a schedule could be arranged that would be elastic enough

* Read before the Sixth Annual Meeting of the American College of Chest Physicians at New York City, June 8, 1940

**Chairman, Committee for the Advancement of Undergraduate Teaching in Medical Schools of the American College of Chest Physicians

so that it could be adopted by all the medical schools and at the same time would present to the students the subject of chronic diseases of the lungs efficiently. This committee at the present time is composed of the following men:

Dr H Frank Carman, Dallas, Texas
 Dr J A Myers, Minneapolis, Minn
 Dr Benjamin Goldberg, Chicago, Ill
 Dr Earle Standlee, Washington, D C
 Dr Wm Atmar Smith, Charleston, S C
 Dr Julius L Wilson, New Orleans, La
 Dr Edgar Mayer, New York City
 Dr John Peck, Oakdale, Iowa
 Dr E W Hayes, Monrovia, Calif, Chairman

These are men all deeply interested in this subject and at the present time, with one or two exceptions, are engaged in teaching.

In undertaking this work this organization is fully aware of what has been done during the past 30 or 35 years in our anti-tuberculosis campaign. It is also aware that in spite of this work which has been done in the past, tuberculosis still continues to be a very serious problem, evidenced by the fact that it still occupies first place as the cause of death in the age period of 15 to 45 years and, in addition, produces a vast amount of sickness and suffering.

The fact that tuberculosis continues to be such a serious problem is particularly lamentable because it is both preventable and curable. In other words, if we would employ in our defense mechanism the facts that we have about this disease at the present time, it would have no more serious aspects than other infectious diseases, such as small pox, diphtheria, typhoid, etc. We must then consider wherein our weakness lies in our fight against this disease.

As we investigate what has been done in the past, we find that it has been accomplished, first, by research participated in by relatively few medical men, second, by a campaign of prevention carried on almost entirely by lay people. The medical profession as a whole has taken very little, if any, part in this work.

Investigation also reveals that progress by the means employed in the past has reached a stand still and that the further solution of the situation depends directly upon the medical profession as a whole. In other words,

the family physician must shoulder the burden because it is he who is out in the front lines in a position to see and to diagnose the early cases, and it is also the family physician who, because he has the confidence of the patient and his family, is in a position to get the patient to not only do what he should to get well, but also to avoid infecting others.

The education of the public so that they will cooperate with the medical profession is an essential in the control of tuberculosis. Here, again, it is the family physician, because of his intimate contact with the family who is in a position to do this educating, but because he himself has not received a training while he was being made a physician, he is not able to carry on this education. In other words, we are failing to educate those who in turn should do the educating.

Your committee during the past four years, through questionnaires, has made a rather detailed study of the set-up for teaching chronic diseases of the lungs in the medical schools throughout the country. Besides, they have studied the recent report made by the American Medical Association as a result of its survey. It is our conclusion that there are not more than eight or ten medical schools today that offer the students an adequate training in this field.

It is not the opinion of the committee that the student should be made a specialist in this work, but rather that he should be made lung conscious and should be given a workable understanding of the diagnosis, prevention and treatment of tuberculosis.

It has been suggested that a training in this field should be secured through post-graduate study. This is true for those who specialize, but not for the medical student. Our present method of training the physician is such that if he is not taught this subject while he is a student, the chances are very strong that he will never obtain any experience or interest along this line. Only one institution out of every 24, where internships are served, now offers a service in tuberculosis, and in many of these, where such services are offered, they are such that the interne gets very little practical benefit. Again, as Dr Casparis of Vanderbilt Univer-

(Continued to page 348)

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Descriptive Booklet on Request

MEDICAL DIRECTORS

Ralph C. Matson, M.D., & Marr Biscaillon, M.D.
1004 Stevens Building Portland, Oregon

(Continued from page 346)

sity told us at the meeting of the National Tuberculosis Association in Los Angeles two years ago, "If we are going to interest the man in the general practice of medicine, we must contact him on an individual basis." He added that it is possible to contact him on an individual basis only when he is a medical student. He stated that unless we interest the general man when he is a student, we cannot attract his attention or arouse his interest by barrage after barrage of literature because he will not read the literature on tuberculosis for the same reason he will not attend clinics or lectures on this subject.

The annual meeting of the California State Tuberculosis Association was held in Santa Barbara less than two months ago. On the evening previous to the opening of the State Convention a meeting was arranged for all the physicians in Santa Barbara County and in the three adjoining counties. Dr. Chesley Bush, who is well-known throughout California as an able speaker, was engaged to address the meeting on the subject of tuberculosis. This meeting was widely publicized throughout these four counties. When the meeting was held, the President of the Santa Barbara County Medical Association, the presiding officer, was the only one of those for whom the meeting was arranged who attended. This, in spite of the fact that there are few states that have done more than California, especially during the last ten years, to interest the general medical profession in tuberculosis. Interest in this subject must be created while the physician is in the making.

To digress for a moment, I might add that it is also the purpose of this organization to maintain that interest after he goes out to practice by furnishing the family physician with information on tuberculosis that has a practical application to his daily work. An attempt is made to do this through our magazine, *Diseases of the Chest*, and also by

our Pennsylvania Plan which provides for special committees in the State, County, and component Societies which endeavor to bring into the programs of these Societies discussions of the practical problems that have to do with the handling of tuberculosis.

Medical students today, for the most part, see tuberculosis only at its worst as it appears in the wards of public hospitals or under other circumstances where the environment and general care of the patients are such as to present an extremely uninteresting picture and they leave school not only disinterested in the subject, but with a desire to avoid it as far as possible.

We have in Los Angeles a County Hospital recently constructed at the approximate cost of twenty million dollars with 35 acres of floor space and 35,000 beds. Less than a month ago I saw posted prominently on the bulletin board of the admitting room of this institution a sign stating, "No tuberculosis admitted except in acute emergency," and acute emergencies were listed as follows:

- 1 Hemorrhage
- 2 Terminal
- 3 Fever of 103 plus pneumonia
- 4 Spontaneous pneumothorax

A group of us out there are put in the ridiculous and unenviable position of attempting to teach tuberculosis to the students of two medical colleges in that institution, and internes who come from practically all over the country are supposed to receive a training in tuberculosis there.

The establishment in our medical schools of a system of teaching which will create in the mind of the student an interest in tuberculosis that will be maintained after he has gone out to practice medicine will overcome the major weakness in our defense against this disease.

Editor's Note "The Schedule for Teaching Chronic Diseases of the Lungs in Medical Schools," as outlined by the Committee on Undergraduate Education of the American College of Chest Physicians, was published in Vol. VI, No. 7, July, 1940, *Diseases of the Chest*.

ANOTHER MILESTONE PASSED

With great satisfaction we announce that J Z Estrin, M. D., formerly of the Herman Kiefer Hospital, in Detroit, Michigan, has become affiliated with Devitt's Camp in the capacity of resident chest surgeon.

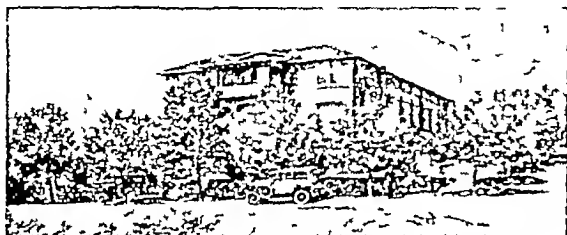
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Organization News

NEWS FROM NORWAY

In reply to a letter sent to Dr Carl Semb of Oslo, Norway, on April 18th, 1940, the following letter was received from Dr Semb

"June 13, 1940

"Mr Frank Walton Burge, M D,

Philadelphia

Dear Doctor Walton Burge

"Thank you very much for your letter of April 18th, which I appreciated very much. It arrived a few days ago. I am in excellent health and for the present time without need of any kind

"I hope, however, to get in further connection with you later on. Please give my best regards to all my friends in America, especially the Chest Physicians and Surgeons

"Again my best thanks for your very careful letter

Sincerely your friend,
Carl Semb"

GEORGIA NOTES

The Division of Tuberculosis of the Department of Health is taking over the pneumothorax refill program launched a year or two ago by the Georgia Tuberculosis Association. In this program, the doctor is paid a nominal fee for given refills to the indigent

A tuberculosis survey of the student body of The Georgia School of Technology (Ga Tech) is being inaugurated this year. The whole group of students, numbering around 3000, are being tuberculin tested and the positive reactors x-rayed

CHANGE OF ADDRESS

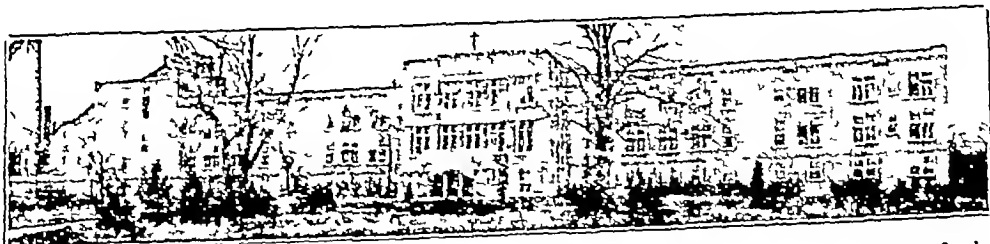
Dr John W Stacey, a Fellow of the College, and for the past year, Assistant Medical Director of the University of Oregon State Tuberculosis Hospital at Portland, has now opened offices at 712 Valley National Bank Building, Tucson, Arizona

(Continued from page 326)

observe two days after the family has removed the Patch, whether a skin reaction has occurred or not. All painful procedure, dilutions, sterilization, etc., has been eliminated by this method of testing. Where a number of individuals in a family require a lung x-ray, the local roentgenologists can almost all be counted upon to be public spirited enough, and good business men enough, to arrange for the raying within

the means of the family concerned. In Philadelphia, where many general practitioners are cooperating in this means of case finding, the roentgenologists are giving splendid cooperation. A single film is adequate for survey work

Mass surveys by Public Health Officials are necessary in that portion of the population that is too poor to have that greatest blessing of mankind, a Family Doctor. F W B



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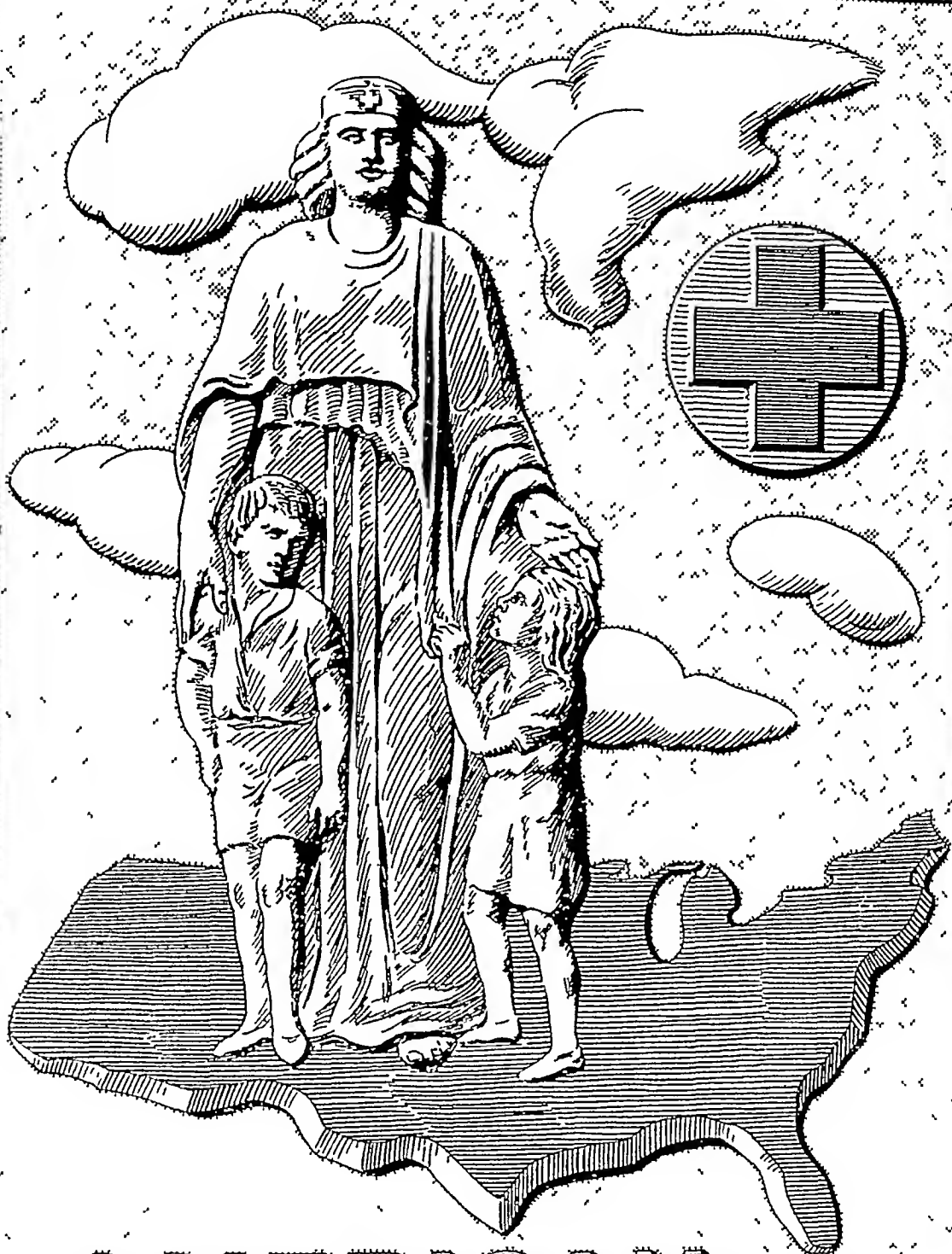
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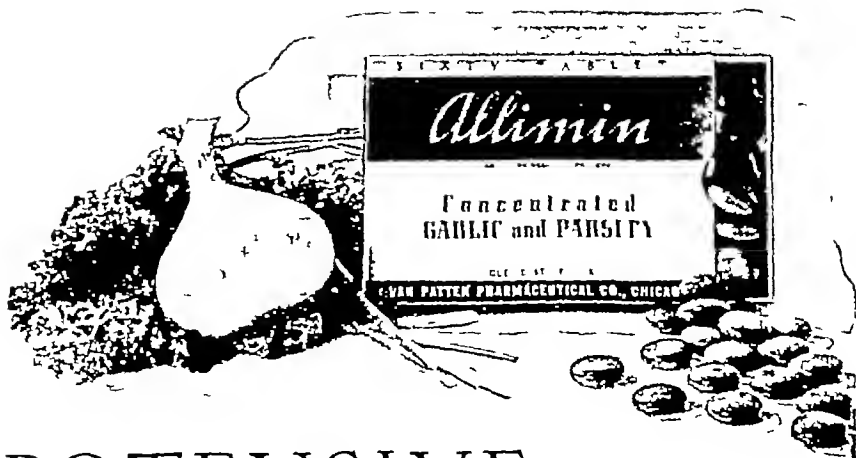
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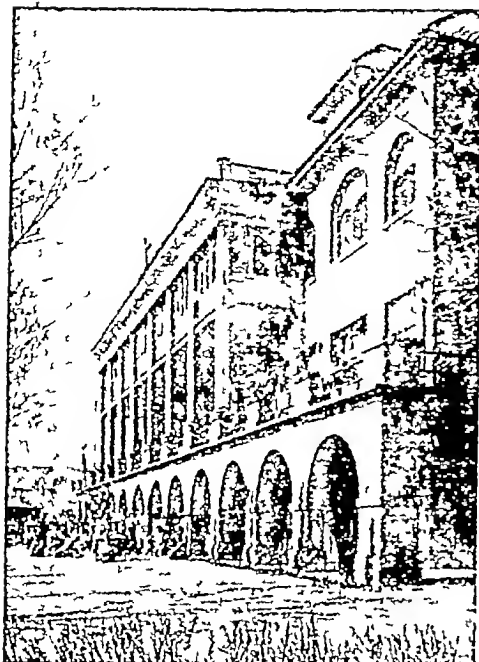
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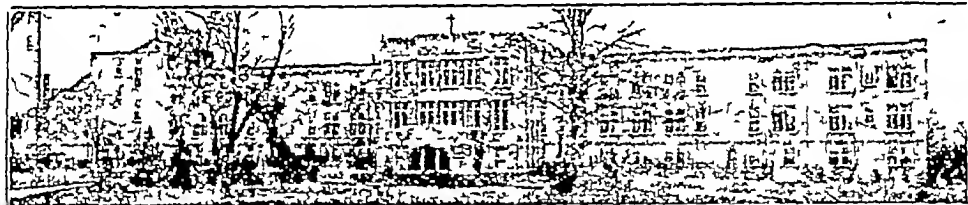
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taurants between users would probably do
much to lessen the spread of epidemic dis-
eases Boiling of ash trays in the home would
lessen the chance of the casual caller leaving
some infectious germs in a dangerous place

Tuberculosis depends for two-thirds of its
spread upon just such loopholes in cleanli-
ness The other third of the cases can be
traced to known contact with a known in-
fectious case

Lieutenant Colonel Arthur Parker Hitchens,
head of the School of Public Health of the
University of Pennsylvania, who has been
stimulating study of the sterilization of drink-
ing glasses, and Dr Robert S Breed, Chief
of the Division of Bacteriology of the New
York State Agricultural Experiment Station
at Geneva, N Y, who has been interested in
the cleanliness of food containers, and other
experts in the public health field, may be
interested in this subject from an experi-

mental viewpoint to prove our assumption
F W B

A Further Thought As pointed out in a very strong
editorial by Dr Frank Burge
in the July issue of *Diseases
of the Chest*, a competent roentgenographic
survey of the fighting forces of Uncle Sam
will be essential, in the preparedness program
of this country It will be essential if the
errors of the World War are not to be re-
peated These errors permitted the enlistment
of many active, or potentially active, cases
of tuberculosis in the army, and there fol-
lowed a resulting break-down in the health
of these individuals and a further dissemina-
tion of their disease to their comrades This
has cost, and is continuing to cost, our govern-
ment many millions of dollars

It is now well known that the best, and in
many instances the only, way to determine
these early active, or potentially active, cases
is by the x-ray examination This situation,
therefore, demands the x-ray examination of
all recruits and also a competent interpre-
tation of the x-ray films This latter is ex-
tremely important and imposes upon the
examiner not only a knowledge of roent-
genography, but a definite knowledge of the
evolution, pathogenesis and prognosis of tu-

berculosis In this connection, the excellent articles of Dr Leopold Brahdy of New York City are to be highly recommended Dr Brahdy very clearly and comprehensively discusses the problem of the primary lesion as it factors in roentgenographic surveys

The differentiation of these primary infection lesions from the significantly important early re-infection lesions may be very difficult, but a failure to make proper differentiation may result in grievous error The recorded results of previous tuberculin tests on individuals under question offer considerable aid A previously recorded positive tuberculin reaction greatly simplifies the issue in that the lesion almost automatically falls into the re-infection group Dr Brahdy emphasizes, therefore, the importance, or rather the necessity, of combining periodic tuberculin tests with roentgen case-finding, in adults The writer feels that this point should be stressed in view of the tendency to minimize the value of tuberculin testing of adults, particularly in the metropolitan areas

C H H

Past and Present "The Captain of Men of Death"

had been the title, which until fifteen years ago was reserved for tuberculosis Until that time, as far back as history dates, tuberculosis had caused more deaths than any one single disease More recently, however, due to the marked inroads that scientific medicine and public health procedure have made in combating infectious diseases, there has been a notable decrease, not only in the mortality from tuberculosis, but also in the mortality arising from other bacillary diseases This has resulted in an increase in the average span of life in this country Twenty-five years ago, the average length of life was approximately forty-eight years, it now is fifty-nine years in these United States of America

Supplanting those diseases which previously stood in the forefront of our mortality tables, have come a group of conditions termed degenerative diseases These affect principally the vascular channels, which include the heart, the blood vessels, and the kidneys While the problems involved in the study and research of these varying pathological conditions have proven very intriguing, they have not as yet yielded much beneficial

information Especially has the condition termed hypertension, either as an essential condition, or as the end result of pathologic changes in the vascular system, remained somewhat of an enigma For many years, there have been a host of therapeutic agents used empirically in the management of these conditions Among these agents, clinical observation has noted benefit from the utilization of concentrated garlic extract in the management of certain hypertensive states Research is, at this time, being carried on, utilizing such garlic extract, and within the next several months the results will appear in the medical literature Our present knowledge of this research dictates that certain benefits in some types of hypertension have been recorded in the study of this problem and we, therefore, call to the attention of our readers this new form of therapy

B G

"Information Please!"

A most attractive innovation was made in the program at the recent annual meeting of the American College of Chest Physicians in New York City, and an innovation that time should see crystalized into an enduring permanentcy This was the "Information Please" luncheon

Questions formulated and sent in by members were submitted to a group of "experts" The answers were not rehearsed, but were given in the wholesome spirit of spontaneity For each of the two luncheons, a different group of "experts" were seated upon the raised platform They were chosen from the ranks of those who have become outstanding in their specialty Thoracic surgeons, clinicians, roentgenologists, pathologists, bronchoscopists, etc, were represented among them

The lovely Bowman room of the Hotel Biltmore furnished the attractive setting for these luncheons, and this spacious room was well filled on the occasions A microphone and loud speaker hook-up made the reading of the questions by the master of ceremonies and the answers by the expert clearly audible to everyone

Think up a question for "Information Please" at the next annual meeting in Cleveland You have a whole year in which to do so

C H H

Address of the Incoming President*

The College Advances Toward Objectives

JOHN H. PECK, M.D., F.A.C.C.P.

Oakdale, Iowa

To stand here before you, and make the statement usual in such instances, that one is deeply honored, and appreciative of the honor, is but froth in the cup. What really counts is the intent and the ability to demonstrate that the honor is not unwisely bestowed. Of my intent to prove worthy, I hope there is little doubt in your minds. Of my ability to foster and to further promulgate the aims of the College so capably defined by my predecessors, I myself have more doubts than any of you can realize, except those who also have suffered the trepidation I feel in dedicating myself to the interests for which the American College of Chest Physicians stands. As a man small in stature may rise to great heights in achievement, so the man to whom nature has ordained more massive contours may fall in achieving his goal. I beg you to take into consideration the limitations of which I am only too well aware

and to extend me all the assistance and encouragement possible I shall need it.

An incoming president has little of his own accomplishments to present, but he can and properly should, acknowledge the debt he owes to those who have preceded him and set him an example, and he can pledge his energy to holding intact what already has been gained and proven worthy and to make as much further progress as his limitations and support allow.

The value of preparedness is being thrust upon our notice daily. We Fellows of the College should be alert to the dangers of dalliance and be actively interested in promoting the interest of the general practitioner in chest diseases, not because chest diseases are the only menace, but because they have a way of sneaking up and striking when least expected. The need for foresightedness, for establishing bulwarks of defence and prevention, is no less great because we are fighting disease than it would be if we were attempting to hold off a gigantic war tank rolling steadily toward us. Indeed, concerted action in all forms of medical work is of greater importance than ever before. Who knows into what terrific cataclysm the medical profession may be plunged before another year. Now, before any crises, other than those always present, are before us, we need more than ever to stand shoulder to shoulder.

Without decrying the immense value of the social aspects of tuberculosis treatment, one must admit the value of science. We need look backward but a few years to recall the contributions which have been made through scientific study and research. It is my wish that the committee for the advancement of scientific programs in organized medicine should stimulate establishment of a section on chest diseases in the American Medical Association, to the end that those who are engrossed in their routine work may know what is being done, and be ready to utilize any new thing which is proffered bearing the

* Sixth Annual Meeting, American College of Chest Physicians, New York City, June 8-10, 1940

stamp of approval This section on chest diseases could well include cardiology A fine start has been made this year and we all are proud that an excellent symposium will be given in the Section on Medicine Wednesday afternoon I am sure that this method of reaching the practitioner is more valuable than discussion of similar phases of tuberculosis within our own organization

Through the committee on advancement of tuberculosis organization in medicine there has been, during the past year or two, talk and effort designed to complete a more compact tuberculosis organization, to the end that efforts may be more concentrated and results more rapidly obtained There can be but one worthy object in organization and that is an objective toward the eradication of disease and the subsequent well-being of humanity There should be, I believe, a well organized committee on tuberculosis in every state, affiliated with the State Medical Society and through it extending to every County Society and every individual member

We should continue to raise standards for Fellowship in the College, not to make it more difficult for entrance, but to insure the best timber Nor should we wait until a doctor has achieved prominence to attempt to interest him in the importance and study of chest diseases This seeming paradox may be worked out by encouraging young doctors to become interested in the College by associate-ships This, of course, must be approved by amendment to the constitution and by-laws, after which suitable machinery must be set up to carry out these advances The college must not be static

The circulation of our journal, *Diseases of the Chest*, though past the 10,000 copies monthly, is not enough Every general practitioner should have this Journal Suggestion has been made that this increased circulation be financed through formation of a women's auxiliary to the American College of Chest Physicians, which auxiliary would carry the burden of this distribution, and further suggestion was made that the Chairman of the Board of Regents and Editor of the Journal might withdraw from these offices and devote himself to the task of organizing this auxiliary It is requested that Fellows give the matter serious thought and express their

sentiments to the Chairman of the Editorial Board We hope to have some definite opinions to consider

Another method for interesting the general practitioner in diseases of the chest was suggested by Dr Goldberg, viz having standardized papers on tuberculosis which would be read at local societies and which would be distributed to the general practitioner Preparation and distribution of such papers would be a part of the duties of the state and county tuberculosis committees

It should be an objective of the sanatorium committee to raise the standards of sanatorium care, no matter how good they already are, and since sanatorium care is impossible for many, to make it possible for the private physician to care for the private case with benefit to both The question of industrial insurance should be more fully developed to the end that as large a proportion of the population be medically self-supporting as possible This committee can well be enlarged It is also my hope that all sanatoria be rated or approved by competent authority, not as general hospitals, but as sanatoria, which rating must of necessity vary greatly in some respects from that of the general hospital where patients remain but a short time, and yet all facilities of value to the patient in a general hospital be available to the sanatorium patient

To the statistical committee falls the duty of keeping in touch with all efforts toward the eradication of pulmonary and other chest diseases, and to make the results available in such form that quick and accurate comprehension is possible They say nothing is drier than statistics Too often this is true, but it need not be so More complete statistics should be had on the forms of chest surgery, on buildings, housing, salaries, rehabilitation—occupational, vocational, and educational The recent questionnaire covers these questions very satisfactorily, and the information thus obtained will be useful when fully analyzed

I have reviewed to some extent already the aims and objectives of the American College of Chest Physicians, and now I would like to stress most emphatically my belief in one of the College's projects—the teaching of diseases of the chest through medical schools There is little, if anything, that can be added

to Dr Hayes' fine presentation of this subject this morning, but I would like to speak briefly on what is being done in Iowa

Because of the proximity of the State Sanatorium to the Iowa State Medical College there is an enviable opportunity in Iowa for medical students to become tuberculosis conscious, to have first-hand training in pulmonary tuberculosis. As a supplement to the medical routine of our Medical College, senior medical students are required to spend two weeks in actual residence at the State Sanatorium. They are assigned clinical clerkships under the staff physicians. They accompany him on his rounds, they see the patient for taking history, diagnosis, bedside care, they hear the case discussed at staff meetings, they are given demonstrations of the importance of the laboratory, the x-ray, the social service, the rehabilitation, vocational and educational side of the tuberculous patient's problems. They see the patient not as Case No. so and so, but as John Smith, or Mary Jones, who may some day be sitting in their offices, wondering what ails them, and expecting to find out. He sees the patient as a part of the community, a part which must be strengthened lest the community weaken—a chain is no stronger than its weakest link—and there are still too many tuberculosis links, in spite of pneumothorax, phrenics, pneumoperitoneum, bronchoscopy, etc. Some authorities claim that the death rate per tuberculous patient is as great as it was twenty or twenty-five years ago. This may be open to question, but there is still sufficient tuberculosis to demand that the newly graduated physician should be prepared to see it lurking behind the masks of bronchitis, asthma, nervous exhaustion, or any of the hundred and one masks it assumes. It is not enough that those of us with ten, twenty, thirty years of experience behind us, know how to pull off the mask. Those who are going to follow us must know more than we did when we started out, and more than we know now.

Years ago a poet wrote

"I shot an arrow into the air,
It fell to earth, I know not where."

He goes on to say that years afterward he found the arrow, still unbroken. Well, and

tuberculosis and other chest diseases, we must have not only the arrows, but we must know what we are shooting at. We, the older men, must see that the medical student is an arrow. We must shoot him in the right direction, and we must see that he, in turn, has arrows to shoot and knows what to shoot at.

So I would like to see, during my incumbency, still greater stress placed on the education of the medical student in the fundamentals of tuberculosis. That this will be difficult, I know. That it is not impossible, I know. That it is desirable, I know. It is the general practitioner who gets the patient first. Therefore, if all the newly practicing general practitioners had practical training in tuberculosis in addition to their academic courses, even though only of two weeks duration, I see earlier diagnoses, a better understanding of the problems of the tuberculous and their importance to the community, and a wider knowledge of what can be done in addition to the time honored remedies of rest, food and fresh air. I urge every one among you to use his influence toward better education of the medical student in tuberculosis.

Also I would like to see greater stress placed on the rehabilitation of the tuberculous. Agreeing that the sanatorium is not the ideal place for rehabilitation, yet it well can be the beginning. We can grant that a patient strictly on the cure, seeing nothing, hearing nothing, doing nothing, encased in a splint, so to speak, can get well sooner than one whose make-up does not let him relax to this extent, but how many such patients are there? Better delay results a little, if by so doing we can persuade the patient to remain long enough to achieve an arrest, rather than let his weaknesses take him away where he will become more and more a problem to the community. Rehabilitation outside of the sanatorium, yes, as rapidly as it can be accomplished, but such rehabilitation centers are as few as the patients who can go into coma when they enter a sanatorium and remain there until arrested. In the mean time, use the sanatorium for a testing-out place, even though little by little. We go *even further*. We have at present 68 former patients working full time, and six working part time. It is reasonable to suppose that these patients, if they had been discharged to work out their

good, but in our efforts to stamp out tuberculosis outside the sanatorium, would soon be thrust back into the sanatorium with almost total loss of what already had been accomplished I might add that the average length of stay of our ex-patient employees is five years Those who leave then are usually well equipped to hold their own outside of sheltered employment

I realize that rehabilitation of the tuberculous is not the prime object of the College, but if we do not teach the necessity of rehabilitation of the tuberculous as well as the diagnosis and treatment, then we are missing something mighty important

Much work has been done by the College

during the past year, and much remains to be done I was not fully aware of the extent and scope of the various committees of the College until recently Looking over these committees and the objects for which they stand, I have been duly impressed With the appointment of new members to various duties, I commend the efforts of their predecessors, and urge a still higher point of achievement for the incoming members

At the beginning of my talk I asked for your assistance and encouragement I now ask your tolerance for the things left unsaid which should have been said, and I ask for your active good will in my efforts to uphold the fine tradition already established

A General View of Tuberculosis in Alaska

A HOLMES JOHNSON, M.D., F.A.C.C.P.
Kodiak, Alaska

Working on the proved assumption that, where an intensive community campaign against tuberculosis has been tried, the death rate from and the incidence of the disease has been definitely lowered, the Alaska Territorial Department of Health, through its Department of Communicable Disease Control, has, with additional funds from the United States Public Health Service, lately begun such an intensive program

In addition to the two full-time physicians of the Department of Communicable Disease Control, including the Tuberculosis Clinician, the Department of Health has eleven Public Health nurses in the Territory who are assisting in this work The Office of Indian Affairs has doctors in charge of their seven hospitals and a number of Field Nurses in the more isolated districts who are cognizant of the program, the local Health Officers and independent physicians are also fully in sympathy with it

Case records from these various sources, and school examination follow-ups, are kept on file in Juneau X-rays taken periodically, wherever possible, are compared to the plates of the previous year and the report included in the record

The need for as complete and intensive a

program as possible against tuberculosis can readily be understood from a few figures

When the death rate in the United States from the disease was 48.9 per 100,000 (in 1938), the death rate in Alaska was 358 per 100,000 In 1937, it was 423 in Alaska against 53.8 in the United States, in 1936, 437 against 55.7, and in 1935, 491 in Alaska against 55 in the United States This, in comparison, is a tremendous difference For comparison with the colored population of the United States, the death rate thereof, in 1932, (only figure available) was 171.9 per 100,000

Of course, it is the native people of Alaska who account for this large death rate as shown by the fact that, in 1936 for instance, the death rate per 100,000 was 794 for the native against 63 for the white population This figure should be somewhat higher for the Whites, as many of this class go "Outside" to a Sanatorium and their death is not allocated back to Alaska, the figure should be lower for the Natives because of the tendency to give tuberculosis as the cause of death in all obscure cases Often, in remote villages, death certificates have to be made out by the local trader or other person little qualified for the task

Tuberculosis takes the lead, in Alaska, as

the cause of death Actual deaths from tuberculosis in 1937 were 254 The next most lethal were diseases of the heart with 194 deaths, followed by accidental deaths set at 123 In 1938 there were 215 deaths from tuberculosis, 161 from Heart Disease and 90 Accidental In that year Pneumonia was rampant and came next to Heart Disease with 114 deaths

Taking the Fremington Ratio of nine active cases needing immediate treatment for each annual death, the number of such cases in Alaska would be 162 Whites and 2,142 Natives Doubling these figures would approximate the total incidence of the disease, or 324 Whites and 4,284 Indians

Most of the statistics given above are from a reprint by the former Territorial Epidemiologist, J A Carswell, M.D,* plus later figures from the present incumbent, Dr Burton L Zinnamon, and checked by the Tuberculosis Clinician, Dr Palmer Congdon, but all admit that the figures are far from adequate because of the lack of official reports

It will be interesting to note that the figures are based on the 1930 census which gives the total White population of Alaska as approximately 29,000, and the total Indian population (including Eskimos) as 30,000 The 1940 census will doubtless see an increase in the White population

In attacking this great problem in Alaska, the first effort of the Health Department is to discover every individual with an Active Tuberculosis This is being done through reports from the various agencies above mentioned, assisted by x-rays taken by the Tuberculosis Clinician wherever possible (These are taken on a portable x-ray machine wherever there is an available alternating current electric plant, even in remote districts far from hospitals)

The second effort of the Health Department is the segregation of these active cases in order to prevent contacts with them of healthy individuals until by treatment—rest, pneumothorax or other surgical measure—they are made inactive This segregation and isolation is the most difficult part of the program and more will be said about it later

The third effort is the investigation of all

contacts with active cases, and the effort to gain their isolation, if they prove to be a potential danger, until x-rays show healed lesions This effort is particularly valuable in discovering early cases before they have had time to spread much infection, and in educating them in the precautions they must take to safeguard others Toward this third effort the Tuberculosis Clinician, in his travels through the Territory, takes x-rays of all Tuberculin Positives of any age, and of all who are known to have been in contact with an active case, as well as of any other individual who has symptoms referable to the chest or other tuberculous focus, whether referred by a doctor or nurse, or presenting themselves because of their symptoms

Pre-school examinations, as well as annual examinations of students, are made as extensively as possible throughout the Territory Constant education is promulgated by the various health agencies and the school teachers as well as by the Alaska Tuberculosis Association

As stated above, the segregation of active cases is the most difficult part of the program Families among the Native population are often large, frequently living together in one small room, often sleeping in the same bed

At present there are no funds for a Territorial Sanatorium, so that the few cases for which funds are available, are sent to hospitals in Seattle and paid for by the Territorial Department of Public Welfare Funds, at present, are available for forty cases In addition, there may be a total of sixty beds that can be used for tuberculosis in the Office of Indian Affairs hospitals It can readily be seen that the great majority of active cases must be cared for outside of institutional management and, with the crowded conditions in the homes, the difficulty of segregation can be realized Under such conditions, even highly educated persons would have difficulty in keeping dishes segregated and sterilized, caring for the sputum, keeping other members of the family, and friends, away from the beloved patient, and to expect this care in the average Native household is an almost impossible hope

These Native peoples are a happy lot—one might say, "happy-go-lucky" They have a great sense of humor When they are in health nothing can worry them Consequent-

* Poverty and Tuberculosis with Particular Reference to the Economic and Social Significance of High Death Rates Among Alaskans

ly, no matter how serious an aspect the doctor puts on the condition, the tuberculous patient, as soon as he has recovered from his more distressing symptoms and is beginning to feel better, regardless of multiple warnings, unvaryingly gets up and about, goes to the dances in which he so much delights—and returns to bed with an extension of the infection. That this experience means nothing to him is indicated by the fact that, as soon as he again begins to feel better, he again gets up and about, this time trying to avoid meeting the doctor on the street, and continues this course of action until he succumbs or, occasionally, recovers.

Of course, if measles intervene in the course of the above, exitus seems fairly sure and rapid. Following an epidemic of measles last year, although all active cases prior to the epidemic were progressing nicely, with temperatures approaching normal, cough abating, etc., after an attack of measles, every case which was at all advanced immediately flared up and all were dead within three to six months except one who is in a serious condition in the Portland (Oregon) Open Air Sanatorium. Other cases became recognizable after an attack and are now running a stormy course. The seriousness of measles in tuberculosis had never before been so thrust upon my attention.

Bovine sources can almost be excluded among Alaskan Natives as, with remarkably few exceptions, all Native children are brought up either on the breast, or on evaporated milk. In addition, most of the cows of the Territory are tested annually by the Territorial Veterinarian and positive reactors separated from the herds. All cattle shipped into the Territory must be tested and all tuberculin positives excluded.

This is rather interesting in view of the fact that we have a large percentage of bone tuberculosis among children, which is commonly thought of as originating in the Bovine form. Our bone tuberculosis must, therefore, be from human contact. As pointed out by Dr. Hays, of the Crippled Children's Service, bone tuberculosis is usually considered an indolent type of the disease and would be expected more among a people with an immunity to the disease, whereas a more acute reinfection pulmonary type would be expected in primitive peoples.

However, x-rays taken among the Native population, interpreted by Dr. Carswell, show that there is a large percentage of healed tuberculosis among the Natives, and he draws the conclusion that the Native has an almost equal natural resistance to the disease as the White person.

Therefore, the conclusion to draw is that inasmuch as the large death rate among the Natives is not due primarily to their lack of immunity, it must be due to their living conditions.

The average income for Alaskan Natives, derived chiefly from fishing and trapping, is not over five hundred dollars and, as large families are the rule, it can readily be seen that under-nourishment would be expected. This is augmented by the fact that, as the Alaskan Native is an American Citizen (not a Reservation Indian), he is permitted to purchase alcoholic beverages and is prone to use them to excess, thus cutting down his small allotment for essential foods as well as lowering his resistance by the excessive use of alcohol.

The chief reason, however, for the prevalence of the disease, it would seem, is the close contacts of everyday life due to overcrowding. Perhaps most of the Natives live in one or two rooms where several may sleep in the same bed. In the cold country, in order to conserve heat, the Eskimo builds an igloo just large enough to contain his family, often with roof too low to permit standing upright and here they eat, sleep and live. It is a commentary on their natural resistance that an even larger percentage do not have an active form of the disease. Even if a doctor or a nurse gets into the district and makes a diagnosis of tuberculosis, he cannot, due to the Natives' economic status, and the lack of an institution to which to send them without charge, do very much about isolation of the patient.

This brings us to the outstanding need of Alaska in combatting tuberculosis, namely Sanatoria. These should be at least two in number—one for the Whites and one for the Natives with a bed capacity equal to at least the number of deaths per annum. In this way the disease would be gradually lessened. If a half million dollars a year were available so that all active cases could be isolated, tuberculosis would be made to take its place with Typhoid Fever and other controlled dis-

eases in a generation

An interesting study on the value of B C G vaccine is being made in a portion of Southeastern Alaska by the Phipps Institute of Philadelphia with the cooperation of the Office of Indian Affairs. This is a five year study started in the fall of 1937, and includes tuberculin testing and x-raying a considerable number of the Native population in this district, followed by giving one-half of the tuberculin negative children the vaccine, using the other half as controls. Dr. J. F. Worley, in *The Health Officer* for last October, reported on the x-ray findings thus far in the study. He states, "Of 3,000 x-ray examinations, 1 per cent showed childhood type of infection, 11.9 per cent, calcified primary lesions, 5.8 per cent, latent apical lesions, 3 per cent, minimal, 1.7 per cent, moderately advanced, and 1.6 per cent, far advanced pulmonary tuberculosis. Thus," Dr. Worley continues, "something less than six per cent of this group has active pulmonary tubercu-

losis, but a total of twenty-five per cent shows x-ray evidence of past or present tuberculosis infection. It is interesting to note that this tallies very well with other findings throughout the Territory.

"Although these proportions seem discouraging, Dr. Aronson recently stated that in comparison with tabulation of 3,597 white persons in the mountains of Tennessee, the incidence of tuberculosis in this group is conspicuously higher than among the Indians of Southeastern Alaska. He also states that the incidence among these Alaskan Natives is very similar to that found in a survey which he made in the slums of Philadelphia."

Thanks to the various Health Agencies in the Federal Government and in the Territory, more funds are being found for this important work so that, if increased funds continue, the next few years should see a definite result from the more intensive work made possible by this increased program.

Griffin Memorial Hospital

Broncholithiasis

DAN W. MYERS, M.D., F.A.C.C.P.
St. Louis, Missouri

Localized calcareous deposits in the lung parenchyma or tracheobronchial lymph glands result from the natural tendency to the deposition of calcium at sites of tissue injury. In the vast majority of cases such intrapulmonary and intraglandular calcifications are a residual of the first infection type of tuberculosis. Less frequently, other forms of inflammatory disease may be responsible, and on occasion stony concretions may develop within bronchiectatic or pulmonary cavities as a consequence of precipitation of lime salts around a cellular or particulate nucleus. Diffuse reticulated deposition of calcium in the alveolar walls, a rare occurrence associated with states of hypercalcemia, presents a distinctive appearance, but does not produce the clinical syndrome of broncholithiasis.

Experienced physicians recognize the great frequency with which calcified foci may be demonstrated in roentgenograms of the chests of healthy adults, and it is generally conceded that these concretions do not by them-

selves constitute evidence of active pulmonary disease. Migration of a calcareous mass into a bronchial lumen may, however, produce clinical symptoms. While this occurrence (broncholithiasis) is not common in proportion to the number of patients exhibiting calcifications, it occurs with such frequency as to demand recognition as a distinct clinical entity. The symptoms observed are correlated either with pressure ulceration of the bronchial wall or with the sequelae of partial or complete bronchial obstruction.

A positive diagnosis demands the visualization of a calculus either through the bronchoscope or in the sputum. Broncholiths are customarily white in color, they may be hard and gritty, or soft and putty-like in consistency. The medical history of patients with chest disease should always include inquiry concerning the expectoration of calcified bodies. It is our habit to pose the following question, "Have you ever spat up anything of unusual nature such as stones or gravel?" One should, of course, be wary of the natural

desire to grasp at such a convenient explanation for all the signs and symptoms manifested by the patient. Although the expectoration of a stone suggests its responsibility for an accompanying hemoptysis, it must be remembered that active tuberculous, suppurative, or neoplastic disease of the lung may be coexistent. The investigation of the case is not completed, therefore, by the mere recovery of a broncholith.

The varied clinical problems presented by the migration of calculi into the bronchial tree may be illustrated by reports of some of the cases which the author has observed in the Barnes Hospital Chest Service and the Washington University Clinics.

Hemoptysis. In seven cases it has seemed to us reasonably certain that a broncholith was the cause of pulmonary hemorrhage. Positive confirmation was obtained in four instances—once on necropsy examination, twice by bronchoscopic observation of erosion or ulceration of the bronchial wall in proximity to a calculus, and in one operative specimen secured when lobectomy was successfully performed for the control of intractable hemorrhage from the right lower pulmonary lobe. In the other cases calcareous masses were expectorated and careful study failed to reveal any other cause for the bleeding.

"Case 1—L C, a white woman aged 54, came to the chest clinic in August, 1934, complaining of cough of from four to five years duration, with production of blood streaked sputum. A brother had died of pulmonary tuberculosis in 1919. The physical examination was not remarkable, and tubercle bacilli could not be found in the sputum. A roentgen film of the chest demonstrated an extensive calcified mass occupying the left apex and numerous smaller calcareous foci in both right and left lung fields and in the tracheobronchial lymph nodes. In May, 1935, the patient reappeared stating that she believed gravel had been present in her sputum. In February, 1936, she expectorated a small broncholith during a coughing paroxysm. Since this date, she has reported to the clinic periodically and has given a history of raising more than twenty small stones, many of which have been preserved in our collection. Expulsion of a calculus was usually accompanied by a tearing sensation in the left chest and by

hemoptysis ranging in quantity from slight streaks to a cupful of blood. During a period of observation of over five years, she has gained weight, the sputum has remained free of tubercle bacilli, and there has been no radiologic change except for a diminution in the extent of the calcified mass visualized in the left apex."

This history demonstrates that repeated episodes may be provoked over a protracted period of time by the slow disintegration of a large calcified mass. The preservation of good health is noteworthy, since it must be presumed that the calcium deposits developed in an old tuberculous focus. Although one might expect that the dissolution of the mass would constitute a mechanism for the bronchogenic dissemination of tuberculous disease, the recent observations of Feldman and Baggenstoss¹ seem to indicate that calcified pulmonary foci in the adult seldom contain viable tubercle bacilli. It is obviously important, nevertheless, to subject such individuals to periodic examinations in order to exclude the possibility of subsequent appearance of active tuberculosis.

"Case 2—J B, a 40 year old white housewife admitted to the hospital in October, 1938, presented a history of hemoptysis occurring at intervals during the preceding seven years. X-ray films taken elsewhere demonstrated that transient atelectasis of the right upper lobe had been present on at least two occasions, five years and one month respectively prior to entry. On admission, physical examination was not remarkable save for suppression of the breath sounds over the upper third of the right thorax posteriorly, and an x-ray of the chest was indeterminate. Bronchoscopy showed granulation tissue about the orifice of the right upper lobe bronchus, and a biopsy taken at this point showed merely a chronic inflammatory reaction. Repetition of bronchoscopy, performed because of failure to demonstrate tubercle bacilli, revealed blood issuing from the right upper lobe. On the thirteenth hospital day, a large hemoptysis occurred, and on the succeeding three days, brisk hemorrhages again ensued. Surgical consultation was requested because of the increasing bleeding which appeared serious in degree and because of the suspicion that a relatively benign type of bronchial tumor was present. Exploratory thoracotomy was per-

formed by incision into the right pleural space, and after complete exposure had been obtained, a large calcified lymph gland could be visualized affixed firmly to the right main bronchus. During the palpation of the structures at the hilum, there was an abrupt change in the patient's condition characterized by cessation of respirations and abrupt decline in blood pressure. Emergency bronchoscopy was immediately performed on the operating table, and it was discovered that the tracheobronchial tree was filled with fresh blood. Despite strenuous efforts to remove the blood, the patient expired as a result of suffocation. Postmortem examination revealed a small calculus, which had apparently come from the hilum lymph gland, wedged in the bronchus to the right upper lobe and eroding into a grossly visible artery in the bronchial wall. The trachea and bronchi contained quantities of blood, but there were no other pathological findings in the thorax."

This case illustrates the seriousness of the hemorrhage which may be associated with intrabronchial calculi. We believe that the operative intervention was a logical procedure despite the unfortunate termination in this instance. Blades and Graham² have apparently saved life in many patients with intractable hemorrhage of undiscoverable etiology through the performance of such major operations without encountering another similar accident. It is possible that preliminary trial of pneumothorax should have been considered, but the necropsy specimen made it appear extremely unlikely that cessation of bleeding would have resulted.

Asthma Syndrome A broncholith, like any other foreign body, may cause partial or complete obstruction of a bronchus. The resultant clinical picture may simulate that of bronchial asthma or resemble the bronchial stenosis associated with tumor. In the following case, both asthma and neoplasm had been entertained as probable diagnoses.

"Case 3—A H, a 49 year old white married female employed as a garment maker, entered Barnes Hospital February 8, 1936. She complained of paroxysmal cough, noisy and labored breathing, substernal soreness, and weight loss, the symptoms having existed for a period of five months. The letter from the referring physician in a distant city stated that her illness had at first been regarded

as bronchial asthma because of the characteristic wheezes and groans audible on auscultation of the chest. Failure to demonstrate an allergic background, expectoration of blood tinged sputum, and transient occurrence of an atelectatic collapse of the right lower lobe had subsequently led to a suspicion of bronchiogenic neoplasm. The initial examination revealed a slightly dyspneic patient breathing stertorously. Auscultation demonstrated the typical wheezing rales of bronchospasm over the left hemithorax with an occasional wheeze audible on the right. There was no evidence of lobar atelectasis or any other parenchymal change in the radiogram. Bronchoscopic examination showed generalized reddening of the bronchial mucosa, slight narrowing of the right main bronchus and partial obstruction of the left main bronchus by a foreign body. The foreign body was extracted in three fragments and appeared to be a characteristic broncholith. Immediately following the bronchoscopy, the patient stated that her respiratory symptoms had been completely relieved, and she remained well according to a report received several months later. After the nature of the bronchial obstruction had been disclosed, further questioning revealed that the patient had expectorated a bronchial stone twelve years previously."

Lung Suppuration The retention of any foreign object in a bronchial lumen is likely to give rise to suppuration in the distal bronchopulmonary segment. Both lung abscess and bronchiectasis have been reported in association with broncholithiasis³. While I have observed the expectoration of gritty particles in several individuals with chronic lung abscess, broncholithiasis has appeared to be the primary pathological lesion in but one personally observed case of pulmonary suppuration.

"Case 4—A M, a 54 year old farmer, entered the hospital in January, 1940, complaining of weakness, weight loss, cough, night sweats, and repeated hemoptyses during the preceding five weeks. He believed that at least a quart of blood had been raised by cough during a three day period two weeks prior to admission. The temperature was 38° C by rectum on the initial examination, pulse 80, and respirations 20. No localizing signs could be detected in the thorax, an

the x-ray film was entirely normal except for the presence of a calcified gland at the right hilum. The sputum was repeatedly examined for tubercle bacilli with negative results. Iodized oil instilled into the bronchial tree showed a marked stenosis of the right stem bronchus between the points of origin of the divisions to the middle and upper lobes, the calcified gland lying exactly adjacent to the stricture. Bronchoscopy confirmed the presence of the stenosis and demonstrated a thickened granular mucous membrane at this point, a small amount of pus issued from the bronchus below the constriction. Bronchoscopy was repeated on three subsequent occasions with the object of securing repeated biopsies to eliminate carcinoma and for the purpose of aspirating secretion from the lower lobe to improve the patient's general condition. Although the biopsy specimens showed no evidence of tumor, surgical operation (middle and lower lobe lobectomy) was recommended because it was deemed certain that the patient would have recurrent infection distal to the marked bronchial stenosis. The patient refused operation, which was not strongly urged, and was discharged. Three weeks later he returned, stating that he had expectorated several concretions about the size of a bean one week after leaving the hospital. Subsequently fever had reappeared and he had begun to raise large quantities of purulent sputum. The temperature on entry was 40° C by rectum, and the examination disclosed signs of atelectasis of the right lower and middle lobes. While in the hospital, the patient coughed up two large soft broncholiths, and another stone was removed by the bronchoscopist. Following elimination of

the calculi, his condition improved, the sputum diminished, and the temperature fell to normal. The bronchial stenosis had persisted, however, and it was anticipated at the time of his second discharge that recurrence of suppuration was inevitable.

The bronchial stricture in this patient appeared to be the most significant anatomical alteration from the standpoint of his future welfare. We believe that this stricture was unquestionably related to the adjacent calcareous lymph node, and the ulceration of calcified portions of this gland through the bronchial wall was chiefly responsible for the suppuration and atelectasis which developed in the right lower lobe.

Summary

Intrapulmonary and intraglandular calcifications may produce disturbance in the occasional instances in which they migrate into a bronchial lumen. The symptoms observed result either from ulceration of the bronchial wall or from the obstruction of the bronchus with attendant atelectasis or pulmonary suppuration. Cases are reported in which hemoptysis, asthma-like symptoms, bronchial stenosis and suppuration were directly associated with bronchial stones.

319 University Club Building

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Pneumoperitoneum in the Treatment of Pulmonary and Abdominal Tuberculosis

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Pneumoperitoneum, the injecting of gas (oxygen or air) in the peritoneal cavity is not a new procedure. It was used as far back as 1902 for diagnostic purposes. In 1917 we find our first reference in treating intestinal and peritoneal tuberculosis by this method, but it was not used to any great extent until about nine years ago.

Richard H. Overholt, in 1930, proved that by injecting air in the abdominal cavities of dogs the diaphragm could be elevated and partially fixed, thus reducing pulmonary ventilation.¹

In 1931, Andrew L. Banyal reported his results in treating 44 cases of tuberculous enterocolitis at the Muirdale Sanatorium, Wisconsin, by injecting oxygen in the peritoneal cavity. Thirty-one, or 70.4 per cent, of the patients got symptomatic relief. Complete relief was seen in 14, or 31.8 per cent, partial relief of all intestinal symptoms in 10, or 22.7 per cent. The duration of symptomatic relief varied from a few days to two years. He made this observation and comment, "Oxygen increases cell activity in all body tissues, effecting a better local and general immunologic response. Injected oxygen due to its chemical properties and increased intra-abdominal pressure will cause irritation of the peritoneum and intestinal serosa with subsequent hyperemia. A decrease in the peristalsis following oxygen inflations was noted in the majority of our cases. By these accomplishments we are approaching the ideal aimed at in the treatment of any form of tuberculosis, that is, possible maximum immobilization with improved nutrition and immune body supply to the diseased tissues."²

Vajoda of Germany in 1933 considered the improvement of the tuberculous process in pregnant women to be due to the upward movement of the diaphragm. He therefore tried to produce this condition artificially by injecting air in the peritoneal cavity. He tried it on two patients. In the first he injected 1200 cc's of air, and in the second, 700 cc's.

No complications developed and the functions of the abdominal organs were not impaired. The diaphragm was forced up to the extent one would get in a very successful phrenic operation. He considered this form of therapy useful in prolonged pulmonary hemorrhage that could not be controlled by other methods.³

Banyal, in March, 1939, reports 91 cases of pulmonary tuberculosis treated with pneumoperitoneum. He states that a continuous intraperitoneal pressure is capable of and does therapeutically relax a tuberculous lung.²

Trimble, Eaton and Moore, in April, 1939, reported 152 cases of pulmonary tuberculosis treated by injecting air in the peritoneal cavity. Twenty of these cases came to autopsy. The term of treatment varied from one to thirty-three months. Fifteen, or 75 per cent, showed no specific local effects on the peritoneum, two showed definite inflammatory changes. In none of these did he consider that the form of treatment had any relation either directly or indirectly to the cause of death. One case died of tuberculous peritonitis. One would expect that in a group of 152 cases anyway, no matter what form of treatment was instituted.⁴ Many articles have appeared in the literature in the past three years, too numerous to mention.

At the Tidewater Memorial Hospital we have fifty patients, the majority of them far-advanced. About fifteen of them are getting pneumothorax, the remainder only rest in bed and symptomatic treatment. I felt that we should at least attempt to do something for these poor, bedridden, unfortunate individuals that were just lying there waiting for the worst to come.

Dr. A. Steiner was our resident physician at that time. I took him two articles to read and told him I was going to try pneumoperitoneum on a few to see how they got along. We selected as our indications, (1) Bilateral pulmonary tuberculosis that had not responded to other forms of treatment, such as pneumothorax and other forms of collapse therapy, (2) Bilateral pulmonary tu-

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berculosis cases that were too sick for any other form of collapse therapy, (3) Pulmonary hemorrhage that could not be contracted by other methods, (4) Tuberculous enteritis and peritonitis, (5) Intestinal hemorrhage

Report of Cases

To date we have used this form of therapy on 12 patients. The first, J G, was a white male, age 33, who had bilateral pulmonary tuberculosis with severe abdominal and genito-urinary symptoms. He had been sick since 1937. Pneumoperitoneum was started November 15, 1938 for severe abdominal cramps. It was continued until December 9, 1938, when he left the sanatorium with some relief of abdominal symptoms.

Case 2—J M S, white, male, age 29, had been sick since November 1930. He was in Blue Ridge Sanatorium eighteen months. He then worked two years as a clerk. In November 1935, he had a spontaneous pneumothorax on the right side with pleural effusion. He was in a General Hospital five weeks, then was transferred to Catawba Sanatorium in December 1935, where he remained until August 1938. In the meantime the disease had spread to the contralateral lung and multiple cavities had developed in both lungs, the larger being in the left lung. Pneumothorax had been attempted with no success. Thoracoplasty had been advised for the left side as soon as the right lung had healed sufficiently to stand the operation. He entered Tidewater Memorial Hospital November 18, 1938 with active bilateral tuberculosis, multiple cavities, the one on the left about the size of a lemon, sputum positive, raising from one to three ounces a day. He was started on pneumoperitoneum on January 27, 1939, taking around 1200 cc's of air a week, given in two injections in the beginning. His cough improved, the quantity of sputum increased at first, then reduced considerably. He has shown marked improvement in many respects. Cavities on the right have closed, the one on the left reduced in size. The diaphragm had been elevated to about the fourth rib front, and seventh back. On October 13, 1939 we had a temporary phrenic done on the left, endeavoring to fix the diaphragm at this point. The patient is still under treatment, getting one refill a week of 700 to 1000 cc's each time, this being quite a large man. Sputum

is negative.

Case 3—J R M, white, male, age 33, clerk, stopped work August 1938, having dropped from 120 to 97 pounds in weight. He entered Tidewater Memorial Hospital September 13, 1938 with bilateral pulmonary tuberculosis involving the greater portion of both lungs. This man was critically ill. He was thought too sick to consider any form of collapse therapy. Soon after entering the hospital he developed abdominal symptoms, very suggestive of tuberculous enterocolitis. His appetite and digestion failed, he had severe cramps, with six to twelve loose bloody stools a day. His hemoglobin dropped to 55 per cent. In December, 1938, he was transferred to Norfolk General Hospital. He was given two transfusions, external sphincter cut to relieve him of his constant tenseness. He got some relief from this, but continued to have digestive disturbances, abdominal cramps and many loose bloody stools each day. In the meantime he had developed small cavities in both lungs with profuse expectoration. On February 14, 1939, I started pneumoperitoneum, giving 500 cc's a week. He was also put on Vitamin B Compound with Iron diet. His sputum was soon reduced, abdominal symptoms improved, bowel movements reduced to one and two well formed stools a day, temperature returned to normal, but he was never able to put on much weight. An x-ray picture made November 6, 1939, shows cavity on right closed, much fibrosis and clearing of right lung, upper half of left about the same. Diaphragm elevated to about the fifth rib in front. He is still under treatment, taking 500 cc's of air once a week. Pneumoperitoneum changed this progressive, critically ill man into a comfortable and slowly improving patient. His sputum is still positive.

Case 4—D L M, age 43, white, male, entered Tidewater Memorial Hospital January 1, 1939. He had bilateral pulmonary tuberculosis with a positive sputum. Wasserman was four plus and a rather severe form of diabetes mellitus was present. He was immediately put on Anti-Leutic treatment and a diabetic diet and Insulin. During February, he developed a large abscess in the hip following an injection of Bismuth with sloughing. Whether this was due to the Bismuth or the diabetics we were unable to determine. As

a result of this complication he came near dying. An x-ray picture made a little later showed a large cavity in the lower lobe of the right lung and a good deal of softening in the left. Pneumoperitoneum was started May 5, 1939. A picture made June 6, 1939 showed the cavity almost obliterated. In September, the patient began to complain of severe abdominal pain, loss of appetite and was rapidly going downhill. Abdomen was very tense. Under the fluoroscope the diaphragm was seen at the 6th rib. We concluded that he was too tight and stopped his treatment on September 11. His appetite returned and he began to improve. Refills were resumed on October 24, 1939 and he is still under treatment. An x-ray made November 18, 1939 showed diaphragm at 4th rib front and 7th rib back. The left lung was much clearer. Cavity on the right, which had reopened, pushed up and near the hilus. Sputum was negative.

Case 5—M B, colored, female, bilateral tuberculosis with a cavity, was critically ill. Pneumoperitoneum was started May 5, 1939, stopped June 3. There was no improvement, and the patient died a few days later.

Case 6—T L, age 21, white female, had a large cavity in the lower lobe of the right lung, and positive sputum. Pneumothorax was induced, but we were unable to close cavity because of multiple adhesions. In December, pneumolysis was attempted with only partial success. The patient developed empyema with a spread of the tuberculous lesion to the contralateral lung. She then developed abdominal symptoms very suggestive of tuberculous enteritis. Pneumoperitoneum was started March 4, 1939. She got slight relief from her abdominal symptoms, but continued to go downhill and died May 19, 1939.

Case 7—A C, age 21, white, female, had been quite sick for a long time, right lung being bound by thickened pleura following pneumothorax and empyema over half of left lung, infiltrated and having a large cavity. Pneumoperitoneum was started May 5, 1939. The patient soon began to show toxic symptoms. I advised discontinuing the treatment, which was done on May 26, three weeks after it was started. This was the only case where I thought the treatment definitely made the patient worse. She had very little normal lung tissue to begin with. By com-

pression, this was greatly impaired, producing anoxemia. The girl picked up after the air was absorbed and returned home. I understand that she is still alive.

Case 8—J Z, white, male, age 44, entered the hospital on March 3, 1939, with the greater portion of both lungs involved, raising about eight ounces of positive sputum a day. Wasserman four plus. He was put on Anti-Luetic treatment and bed rest, but continued to go downhill. He developed severe abdominal symptoms, cramps and diarrhea. X-ray of tract did not give any definite information. We concluded that he had tuberculous enteritis and started pneumoperitoneum on August 8, with slight improvement of his abdominal symptoms. X-ray of his chest made October 30, 1939, showed some improvement over films made in February, with diaphragm elevated to the fifth rib. Patient is still under treatment and holding his own.

Case 9—T J, white, male, had tuberculosis for several years. This was far advanced, with large cavity in upper left. He hemorrhaged about six ounces on November 14. On November 16 he was given 525 cc's of air with a plus eight reading, November 8, 600 cc's with a plus eight reading. No more bleeding was present and treatments were continued. He hemorrhaged November 30, 1939.

Case 10—H B S, white, male, age 22. This man had a far advanced bilateral case with large cavity. On November 14, 1939, he hemorrhaged about 16 ounces. On November 15, 500 cc's of air were injected in peritoneal cavity. November 16 he hemorrhaged 24 ounces. November 17 we gave him 1000 cc's of air, November 18 he hemorrhaged 30 ounces and died.

Case 11—S, was a colored male, bilateral case with cavity. On November 23, 1939 he coughed up about 15 ounces of blood. On November 24, 750 cc's of air were injected in peritoneal cavity, on November 25, 550 cc's. On November 27 he had another hemorrhage of five ounces. We gave 1000 cc's of air in peritoneal cavity. On the same day, at 3 30, he hemorrhaged 10 ounces. At midnight of the same day, he raised 1½ ounces more. On the following morning, Dr Ray attempted to collapse the left lung, gave 500 cc's of air. At 7 p m, he raised 3 ounces, and at 1 a m, 4 ounces. On November 29 another 150 cc's of air were injected in left pleural space and

at 10 a m he raised 8 ounces of blood This man was also getting all of the routine treatments for controlling pulmonary hemorrhage, of which none were of any avail *

Case 12—F D, was colored, female, age 23 She was a very far advanced bilateral case, raising about 16 ounces of sputum in 24 hours, positive for tubercle bacilli She was taken sick in May 1939, and her normal weight of 125 pounds, dropped to 89 pounds Hemoglobin 52 per cent, R B C 3,280,000 and sedimentation rate of 32 The patient was rapidly going downhill, so I advised pneumoperitoneum On November 18, 1939, no breakfast At 8 45 she was given Morphine gr $\frac{1}{4}$, Atropine gr $\frac{1}{150}$ by hypo At 9 30 pneumoperitoneum was attempted The needle entered easily, no blood came from the needle, 25 cc's of air injected, then 50 cc's and 100 cc's The manometer changed only two points, 200 cc's more were given At this time, patient went into collapse, pulse weak and thready Adrenalin was administered, she had an involuntary movement of the bowels and bladder, died in five to ten minutes, cause not determined

Discussion

The technique for this operation has been described numbers of times in the literature We only wish to mention that it is necessary to carry out strict asepsis, and use a blunt needle so as to avoid all danger of puncturing the abdominal viscera We usually make our puncture in the upper left quadrant near the costal border with the patient leaning to the right side There is very little discomfort is sometimes present, and if they are following the injection A sensation of full-

* The hemorrhage cases finally came under control and are doing very well, with the exception of a negro patient, case number eleven, whose disease is spreading

made very tight, pressure up against the diaphragm produces some pain in both shoulders As a rule they are not able to take quite as much food with each feeding, and it is best to give nourishment between meals The manometer as a rule oscillates very slightly with the first injection, but with subsequent refills, as the patient becomes tense, you get a positive pressure from plus five to plus ten

One might ask, are you justified in attempting a treatment, the value of which has not been definitely proven In selected cases we think so The chronic bedridden case that has failed to respond to the routine treatment should be given the benefit of anything that offers him a ray of hope for improvement and relief Three of our cases, or 25 per cent, were definitely benefited, both symptomatically and clinically, and are still improving One hemorrhage thus far has been controlled, the other two not benefited One case was made temporarily worse and one died as the result of the treatment The remaining five showed very little if any change

We fully realize this is a small series of cases to report We also realize that in order to give proper evaluation to any form of therapy it is necessary to report failures as well as successes

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Discussion

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It is alike a privilege and a pleasure to be able to speak on this paper of Dr Harrell's on Pneumoperitoneum

Pneumoperitoneum is used in pulmonary tuberculosis and in the abdominal forms of

tuberculosis as well In tuberculous peritonitis it is an academic and orthodox procedure In intestinal tuberculosis it has been frequently used, the air within the peritoneal cavity causes an inhibition of the nerve influence, thereby decreasing the intestinal spasm in most cases and the patient is ac-

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cordingly made more comfortable The pneumoperitoneum apparently brings about only a symptomatic improvement in the enteric and the enterocolonic tuberculosis as most pathologists have found no difference in intestinal tuberculosis in those cases treated with pneumoperitoneum and those not so treated

In the treatment of pulmonary tuberculosis, pneumoperitoneum is a rather recent form of therapy, and while it will not supplant any of our present forms of active therapy, there are certain indications for its use when phrenic paresis, pneumothorax, thoracoplasty, etc., are either contraindicated or unsuccessful While this procedure is going through this trial stage, as all new procedures must, it is wise to bear in mind certain indications for its use

First In cases of advanced bilateral disease in which the low vital capacity prevents any other form of bilateral collapse In a good percentage of these cases the pneumoperitoneum will be accompanied by definite improvement in the disease and often as much improvement on one of the sides as to enable the operator to carry out a more energetic procedure on the opposite side I think Dr Harrell's cases well represent this indication

Second In cases of unilateral disease with cavitation in which pneumothorax has failed While a thoracoplasty will be necessary on most of these cases, pneumoperitoneum will close a number large enough to warrant its trial for several months before thoracoplasty is undertaken and while thoracoplasty would be contraindicated

Third In basal lesions with or without cavitation where a phrenic paralysis is indicated, pneumoperitoneum may be used, but in such cases the pulmonary lesion should be watched closely and pneumothorax should be attempted in case the disease fails to respond But I must confess that my own limited experience dictates that the best form of treatment in basal lesions is a phrenic reinforced by a pneumoperitoneum, holding pneumothorax or thoracoplasty in reserve We have in the hospital now a case which

illustrates this viewpoint We have a colored woman, 28 years of age with large basal cavity, pneumothorax was instituted with a fair collapse, and the only result so far, is an increase in the size of the cavity and a spread into the contralateral lung We are attempting to correct our blunder by having a phrenic and later on, expect to start pneumoperitoneum We feel this will save this woman from a thoracoplasty which will take all the ribs on her diseased side

Fourth In cases of pulmonary hemorrhage in which the side responsible for the hemorrhage cannot be determined, or when the side responsible may be determined, but pneumothorax is unsuccessful We have in the hospital two cases now treated by pneumoperitoneum which illustrate these indications One, a man transferred from Blue Ridge, age 45, to await a suitable time for thoracoplasty, immediately after his admission began to bleed, we were uncertain from which side the blood was coming, as both lungs were greatly involved, pneumothorax having been attempted and abandoned in both sides After bleeding some days with no other procedure possible, we instituted pneumoperitoneum He has bled only one day since starting this treatment The other case is an unilateral case of long standing, age 52 years, with history of frequent small hemorrhages Soon after admission we attempted pneumothorax which failed to collapse the diseased areas and bleeding continued We then had a phrenic done within 30 days, and the largest hemorrhage of her lifetime occurred We at once instituted pneumoperitoneum and the bleeding so far has not been resumed She is still under treatment

Fifth In cases of phrenic paresis, where compression is inadequate, reinforcement with pneumoperitoneum may aid in the better compression Truly we believe pneumoperitoneum is the handmaid of the phrenic

All of these indications have been dwelt upon in this paper of Dr Harrell's and what I have had to say is but a feeble repetition of the indications of pneumoperitoneum as set forth in this most excellent evaluation of the procedure I thank you



Sanatorium Treatment of Tuberculosis

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The primary function of a sanatorium is the one fundamental and first in the activities of any hospital, namely, care of the sick, and in this instance, the attempt to obtain an arrest and cure of tuberculosis. Whether an arrest of the disease will occur depends on many factors, such as age, sex, race, occupation, and complications, but particularly on the stage of the disease. In spite of the repeated emphasis of the fact that the chances for recovery and a good prognosis in pulmonary tuberculosis depend on the extent and degree of lung involvement at the start of treatment, the number of patients that begin treatment with far advanced disease is tremendously high. At the present time, 75 to 85 per cent of the admissions to the sanatoria and tuberculosis hospitals of this country are in a far advanced stage. Our experience has indicated that treatment of a sanatorium group of patients with 85 per cent showing minimal or moderately advanced lesions (minimal 35—40%, moderately advanced 45—50%), will result at the time of discharge with 85 per cent in a condition graded from improved to arrested and close to 50 per cent in the latter category.

Thus the efficacy of sanatorium treatment depends in a great measure on the early diagnosis and reference of the patients. All health efforts to find, isolate and treat pulmonary tuberculosis in an early stage are not only justified but necessary. It is especially the general practitioner who should seriously accept the slogan "Find and treat tuberculosis early," for he is the individual who often makes the first contact with the patient. Proper recommendations by him at that time will frequently determine the eventual outcome of the disease.

Follow-up studies of discharged cases have indicated that the permanency of a satisfactory physical condition (with a stationary or retrogressive lesion, negative sputum, slight or no symptoms, and return to work or normal environment) depends directly on the stage of the disease with the best results in the minimal group and the highest unsatisfactory percentage (with progression of the

lesion, positive sputum, symptoms, need of hospitalization, or failure to return to normal environment) in the far advanced stage. Moreover, the importance and necessity of uninterrupted sanatorium care until the condition becomes arrested has been further evidenced by the follow-up observations that (1) The closer the physical status on discharge approaches a condition of complete arrest, the greater the probability of continuation of a satisfactory condition after hospitalization, (2) the percentage of good results is less for those patients who leave the institution against advice, and (3) arrested cases form a majority of those patients, who after discharge are able to return to a gainful occupation or are in condition to work.

The next great function of the sanatorium is its service as an educational medium for the patients. In the teaching of new health habits and demonstration of proper modes of living, the sanatorium instructs patients not only how to care for their own health, but how to live with and protect others. The patients receive both didactic and practical instruction. The didactic training is covered by lectures, the content of which is briefly outlined as follows:

The functions of the sanatorium (i.e., for treatment, removal of positive cases and education of patients) are explained.

Items in a book of rules and regulations given each patient are discussed with constant emphasis on the need of the patients' co-operation to get the best results of sanatorium treatment. This booklet contains not only rules of conduct and sanatorium regulations, but items of a general nature and their influence on tuberculosis, such as rest, fresh air, heliotherapy, food, tobacco, etc., and instructions and suggestions for the patients in relation to these factors.

The manner of spread of tuberculosis is explained and the many methods responsible, such as coughing, sneezing, spitting, kissing, contamination of utensils, body discharges, etc., are expounded upon. The viability of the tubercle bacillus in sputum droplets and dust particles, under conditions of drying and

freezing, and poor light and ventilation and its death by sterilization, sun and fresh air, is discussed. All of these items are commented on in relation to the patient and his hospital activities and also to the home environment that is to follow.

The prophylaxis of tuberculosis is emphasized and proper personal hygiene is explained. This includes care of the hands, (particularly after every possible contact with infectious material), mouth hygiene, and the use of gauze or paper napkins and sputum cups. This instruction is important as the patients learn how to prevent spread of infection to other people and how to maintain scrupulous personal cleanliness.

The fundamental requirement of rest and good food and fresh air in the treatment of tuberculosis is stressed. Particular emphasis is placed on the efficacy of rest, and the meaning of true medical rest and the sanatorium rest hours are explained. Thus patients learn that complete rest is unobtainable with any degree of physical activity or mental stimulation, and talking, reading, writing, radio playing, are not allowed during rest periods. A proper mental outlook is important and an atmosphere of cheerfulness, a spirit of contentment and a feeling of hopefulness are engendered.

The indications and mode of action of the various surgical adjuncts of collapse therapy are explained so that the patients will cooperate with the physician and understand the needs for these various measures.

Readmissions to tuberculosis institutions average between 15 and 20 per cent. Special discharge advice is given patients because it must be strongly impressed on them that there are causative factors for relapse and readmission that can be avoided and prevented.

This advice includes,*

1 Personal hygiene (sputum, dishes, hands, bed linen, kissing, contact at home)

2 Continuation of habits of institution (Rest hours, good room, proper ventilation, temperature and sunshine)

3 Weight and temperature checked regularly

4 Continuation of care by physician or in clinic

5 Additional activity should be added slowly, and only by the instruction of a physician

6 The return to a former or new occupation should be guided by a physician

7 Avoidance of excess alcohol, tobacco, fatigue and loss of sleep

8 Emphasis on need of continued frequent routine examinations, especially periodic x-rays and sputum examinations, as the patient's progress must not be judged by symptoms

9 If pneumothorax is present at time of discharge it is to be continued, and discontinued only on the advice of a physician

10 Inciting causes of tuberculosis are to be avoided (fatigue, worry, excesses, colds, poor food, contact with tuberculous persons)

11 Immediate check with the occurrence of any symptoms of relapse (fatigue, loss of weight, increase in expectoration, or cough, temperature, indigestion, streaking, chest pains or shortness of breath)

The patients procure practical training by actually living the regime outlined in the lectures with help and advice from the physicians and nurses. These activities become good habits, almost automatic reactions, that enable the patients to pattern their lives at home and at all times, according to the routine learned in the sanatorium. They become safe tuberculous patients from the standpoint of spread of infection, and moreover, countless numbers of relapses have been avoided by the patients living according to the sanatorium education.

The treatment of tuberculosis is not complete until the patient is free of all active disease and in a satisfactory economic situation, and thus the need for rehabilitation. Rehabilitation represents activity, either physical or mental, that not only aids in the recovery from tuberculosis, but also assists in the adjustment of the individual to a new economic status. It involves a gradual increase in exercise and work by the patient and is ergo therapy.

Rehabilitation covers a multitude of forms and needs, and includes many subjects, such as commercial (stenography, clerical, typewriting), various arts and crafts (printing, bookbinding, photography, wood, metal and leather work, carpet making, reed weaving)

* From "A Study of Readmissions to Sea View Hospital," *Quarterly Bulletin of Sea View Hospital*, Vol 3, No 3, April, 1938, Drs I. D. Bobrowitz and Jerome L. Leon

and miscellaneous occupations like laboratory technician, barber, tailor, gardener and farmer

The general plan in associating patients with rehabilitation is to grade the patients' physical activity, and in this manner the work is constantly under the direction of the physician. The occupational therapist guides the choice of work by consideration of the educational background of the patient, previous work experience, mental attitude, occupational inclinations and interest and manual dexterity. In more complete programs, a very thorough aptitude test is done to determine the occupation the patient is best suited for. In this a psychologist aids the therapist.

As the patients continue to improve, the activity and time allowed for occupational therapy is gradually increased so that on discharge, they are performing the equivalent of four or more hours work a day.

The desirability of rehabilitation is emphasized by the fact that tuberculous patients are young enough, well enough and intelligent enough to receive skilled training, and there is a particular need for teaching new vocations. To aid in the return to industry, sanatoria are associated with welfare employment agencies, state job placement bureaus or sheltered work shops.

Although the work taught in a sanatorium may not always be of a type directly applicable by the patient for return to an outside occupation, all work performed is definitely useful because it aids and speeds recovery, improves the physical condition of the patient, serves as a hardening process, provides mental stimulation, promotes individual contentment and actually teaches new skills.

We have presented the actual phases of treatment of tuberculosis in a sanatorium, and yet this subject is not complete without mention of the other functions of the sanatorium.

1 Public health duties

- (a) The hospitalization of open cases
 - (b) Public education
 - (c) Case finding
 - (d) Cooperation with health agencies and follow-up studies
- 2 As a center for diagnosis (laboratory work and consultation in tuberculosis and chest diseases)
 - 3 Clinical and laboratory investigation in tuberculosis and chest diseases
 - 4 Scientific teaching and education for medical students, nurses, dietitians, resident staff and visiting staff
 - 5 The work of the Social Service Department in properly adjusting the patient and helping the procurement of a permanent cure by various aids while in the sanatorium and proper reference and advice on discharge.

The activities of the general practitioner are closely related to the sanatorium in many ways. The sanatorium offers him a consultation service and assists in caring for his tuberculous patients. The private physician should impress on his patients the need and value of sanatorium care and the necessity of treatment until discharge occurs as arrested. Collaboration with the sanatorium is essential in order for him to (1) carry out discharge instructions given to the patients, (2) provide frequent x-ray and sputa examinations, (3) aid in the economic and social improvement of the patient, (4) and guide any increase in the patients' physical activity or return to a vocation, or needed change of treatment.

The early diagnosis of tuberculosis is very often the responsibility of the general practitioner and in this lies the most important relation of the physician to the sanatorium, for the success of sanatorium treatment depends particularly on this early diagnosis for with the consequent isolation, treatment and education of the patient, we have our most potent means of reducing the morbidity and mortality of tuberculosis.

Municipal Sanatorium

Review of Monograph

PNEUMOCONIOSIS (Silicosis) — The Story of Dusty Lungs by Lewis Gregory Cole and William Gregory Cole John B. Pierce Foundation, New York City, 1940

The monograph on silicosis deals with the etiology, pathogenesis, anatomy, pathology, roentgenology, clinical, social and economic problems, legislation, and adjudication.

The authors divide the dust particles which cause the condition into non-refracting and refracting elements. The former are large or small opaque flecks best observed under the light field of the microscope while the latter are large or small translucent or opaque bodies and seen effectively under the dark field. The refracting bodies are silica and hematite crystals. The non-refracting elements are jet black or reddish brown or brown flecks or carbon. There is a description of the technique for examining the dust particles.

Pneumoconiosis is divided into four types. The first type has peribronchial and perivascular lymph node manifestations. The second is a nodular type in which hard shotty silicotic nodules are present symmetrically in both lungs. The third is the "pock-marking" type with pneumoconiotic cysts which are usually regarded as emphysematous blebs. The fourth type is acute silicosis and according to the authors it is the most important type because of the seriousness of the lesion. The lung resembles that of partially resolved pneumonia with only slight accentuation of the peri-

bronchial and perivascular structures. Microscopic examination shows anemic areas with collagen deposits, compression of the capillaries and hyperemic areas with marked congestion. So-called silicotic nodules may be difficult to find.

The roentgen-ray features in pneumoconiosis are accentuated hilar and linear markings in type I, small, clear-cut, well defined white spots in type II, small black spots, surrounded by white rings (pock-marks) in type III and a general haze or cloudiness in type IV. The special roentgen findings are "pawnbroker's sign," "angel wings" and "split pleura."

Regarding the social and economic aspects of pneumoconiosis, the authors discuss the laws governing the compensation of victims of silicosis and it is their belief that ninety per cent of the cases recognized as silicosis are not compensable. The individuals having acute silicosis and type III silicosis are compensable.

This monograph is an informative review of the present knowledge of silicosis. A discussion of the authors' experience in some of the complications of silicosis such as tuberculosis and heart disease would have been interesting. Their suggestion for better cooperation between the laborer and the employer for solution of the problem of silicosis is well taken.

F W B

Organization News

DR JOSEPH A. LANGBORD

2112 Pine Street

Philadelphia

"July 26, 1940

"Dr. Frank Walton Burge,
1930 Chestnut Street,
Phila., Pa.

"My dear Frank

"I want to take this occasion to write and tell you how much I enjoyed our convention. It certainly functioned in a dignified manner. The papers were scientific, instructive and attractive. Every phase, such as the luncheons and the banquets, kept pace with the scien-

tific program. On my departure therefrom, I felt that I was much enriched with information that would serve me in my routine work.

"At this time, I want to learn from you what steps the association will take insofar as the Medical Preparedness work is concerned in our city. I forwarded my questionnaire volunteering my services. However, if you will in any way participate in organizing the work in our community, I want to offer you the services and facilities of our clinic which is fully equipped to carry out the work that the government may require.

"I served in the last war in the capacity

(Continued to page 282)

POST INFLUENZAL SEQUELAE—SPECIAL REFERENCE TO LUNGS

DAVID TOWNSEND, M.D., F.A.C.C.P.*
Bristol, Tennessee

A paper under this title was read in Tennessee and submitted for publication. While we cannot at this time present it in full, due to the number of papers awaiting publication, we would like to emphasize the importance of certain points to which Colonel Townsend has called attention.

He notes the close similarity in symptoms and signs which exists between patients with chronic fibroid tuberculosis and those who have suffered from influenza complicated by severe bronchitis, pulmonitis with fibrosis, bronchiectasis and loculated insufficiently drained empyemata. He cites also the frequency of chronic infection of the sinuses.

A frequent result of influenza is the "neuro-circulatory-asthenia" syndrome with marked

dyspnea and rapid heart action occasioned by even slight exertion. These patients are unable to "perform continued mental or physical labor."

In short, the pulmonary and bronchial changes resulting from complicated influenza may bear a close resemblance to those of fibroid tuberculosis, while the toxic manifestations of the chronic infection of sinuses, empyema, etc., may simulate the toxemia of the active phases of tuberculosis, and the functional disturbances resulting in cardiac and respiratory disturbances should also be appreciated.

Colonel Townsend also calls attention to the fact that an apparently mild attack of influenza may have serious sequelae, while a severe primary attack may clear with no remaining disability.

F W B

* Member State Advisory Committee on Tuberculosis, Tennessee

Organization News

(Continued from page 281)

of chief examiner of my district and if my experience counts for anything, I shall be only too happy to render my services as well as the services of all of my men working with me at the clinic and sanatorium.

"Truly yours,

"Joseph A. Langbord, M.D."

JAL K

COMMITTEE ON MILITARY AFFAIRS

The Committee on Military Affairs wishes to announce that over three hundred questionnaires have been returned and asks that those Fellows of the College who have not as yet sent in their questionnaires, complete them and place them in the mail without delay.

MEETING AT ROCKY GLEN SANATORIUM

On June 20th, the Eighth District Ohio State Medical Association met at Rocky Glen Sanatorium, McConnelville, Ohio. Among those on the program was Dr. Chevalier L. Jackson of Philadelphia, Pennsylvania, a Fellow of the College. Other Fellows of the Col-

lege present were Dr. A. A. Tombaugh of McConnelville, who was elected President of the Eighth District Society, Dr. Joseph Placak, Cleveland, Ohio, Regent of the College for District Number 5, and Dr. Louis Mark, Governor for the College of the State of Ohio and Medical Director of Rocky Glen Sanatorium.

REPORT OF THE SECTION ON TUBERCULOSIS OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY

Seven meetings of the Section on Tuberculosis were held during the 1939-1940 Season, with a total attendance of 560. The meetings were held for general practitioners to increase their interest in tuberculosis, particularly in regard to early diagnosis and modern treatment. The meetings were conducted in a manner off the beaten track of the usual scientific gatherings. Written questions from those present were passed up to the Chairman, Doctor Burge, who read them aloud and had them answered by the "ex-

(Continued to page 284)

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MEDICAL DIRECTORS

Ralph C. Matson, M.D., & Marr Biscillon, M.D.
1004 Stevens Building Portland, Oregon

(Continued from page 282)

perts" present Beer was imbibed in moderation during the discussions and afterward an enjoyable repast was partaken of

The success of the Section was undoubtedly due to the excellent cooperation of all the important chest groups in Philadelphia. The meetings will be continued next winter, with perhaps some modifications that are being studied.

Among the speakers who were especially qualified to impart useful information and instruction to the general practitioners present were Doctors Esmond R Long, Eugene Pendergrass, William Lampe, Howard Marcy (Pittsburgh), Gabriel Tucker, Joseph W Post, William Devitt (Devitt's Camp), Howard Bradshaw, Frank Walton Burge, Richard Meade, Jacob Crellin, Robert G Torrey, Seth Brumm, George G Ornstein (New York), A J Cohen, John T. Farrell, Chevalier L Jackson, Edward L Bortz, W Emory Burnett, Francis F Borzell, Frederick D Stubbs, Nathan Blumberg, Louis H Clerf, Severe F Madonna, John L Reeves, Charles L Brown, Hobart A Reimann, and Thomas F O'Leary.

ALEX HERON DAVISSON, M D,
Philadelphia, Pennsylvania

REGENT REPORTS

Dr Moses J Stone, Boston, Massachusetts, Regent of the College for District Number 1, reports on a fine series of papers on Chest Diseases presented at the Meeting of the Massachusetts Medical Society held in Boston during the week of May 19th. He further reports, that the Trudeau Society of Boston, an independent organization having no connection with the American Trudeau Society, has recently raised a fund for a lectureship, which is to be known as the John B Hawes Lectureship and is to be given under the auspices of the Trudeau Society of Boston, during the winter meeting of the Society. Dr Hawes was a former Fellow of the College.

DR RALPH MATSON REPORTS

Dr Ralph C Matson, ex-president of the College and Chief Surgeon and Chief Medical Consultant of the University State Tuberculosis Hospital, Portland, Oregon, reports that John W Stacey, a Fellow of the College, has completed a year of service at the Hospital

as Assistant Medical Director and will open private offices in Arizona. Dr James S Conant, another Fellow of the College, has advanced to assume the position of Assistant Medical Director, vacated by Dr Stacey, and has also become a Fellow in Thoracic Surgery. Dr William A Conklin, a third Fellow of the College, becomes Resident in Thoracic Surgery.

FELLOW APPOINTED TO BOARD OF HEALTH

Dr Francis Marion Pottenger, Monrovia, California, a Fellow of the College, has been appointed a member of the California State Board of Health.

FELLOWS APPOINTED TO MEDICAL SOCIETY TUBERCULOSIS COMMITTEE

Dr Daniel L Borden, President of the District of Columbia Medical Society, recently appointed the new Tuberculosis Committee of the Society for the year ending July 31, 1941.

Dr J Winthrop Peabody, the retiring chairman, will remain as a member of the new committee. The committee is composed of the following men: W Ross Morris, M D, Chairman, Wm Davis Tewksbury, M D, Vice-Chairman, J Winthrop Peabody, M D, James A Wissler, M D, A Barklie Coulter, M D, and Nicholas A Mandelos, M D.

Dr Peabody is First Vice-President of the College, Dr Tewksbury is Governor of the District of Columbia for the College, and Dr Mandelos is a Fellow of the College.

FELLOWS APPOINTED TO IOWA TUBERCULOSIS COMMITTEE

Among the five members of the Tuberculosis Committee of the Iowa Medical Society are the following Fellows of the College: Dr Jesse C Painter, Dubuque, Chairman of the Committee and Governor of the State of Iowa for the College, and Dr John Russell of Des Moines.

MEXICAN SOCIETY HONORS FELLOWS OF THE COLLEGE

La Sociedad Mexicana de Estudios Sobre Tuberculosis, Mexico, D F, has elected Dr

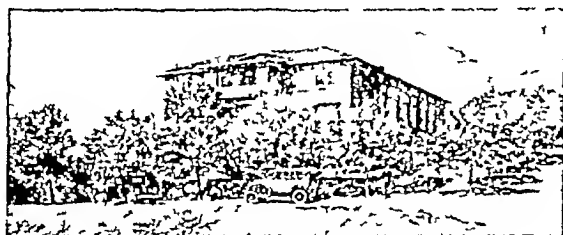
(Continued to page 286)

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E. W. HAYES, M.D., Medical Director

(Continued from page 284)

Benjamin Goldberg, President-elect of the College, and Dr Ralph C Matson, ex-President of the College, to Honorary Membership, in appreciation of their work and scientific standing

tration and is stationed at the United States Veterans Facility at Oteen, North Carolina. Dr Shamaskin has been a Fellow of the American College of Chest Physicians since its inception

NOTICES

Dr Arnold Shamaskin, Medical Superintendent of Montefiore Sanatorium at Bedford Hills, New York, for the past twelve years, is now with the Veterans Adminis-

Dr Giles Wolverton, Fellow of the College, announces the opening of offices at 804 Fidelity Building, Dayton, Ohio. Dr Wolverton was formerly Assistant to the Medical Superintendent of Stillwater Sanatorium and his private practice will now be limited to respiratory diseases

A v a i l a b l e

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Waiakeo, Maui, T H

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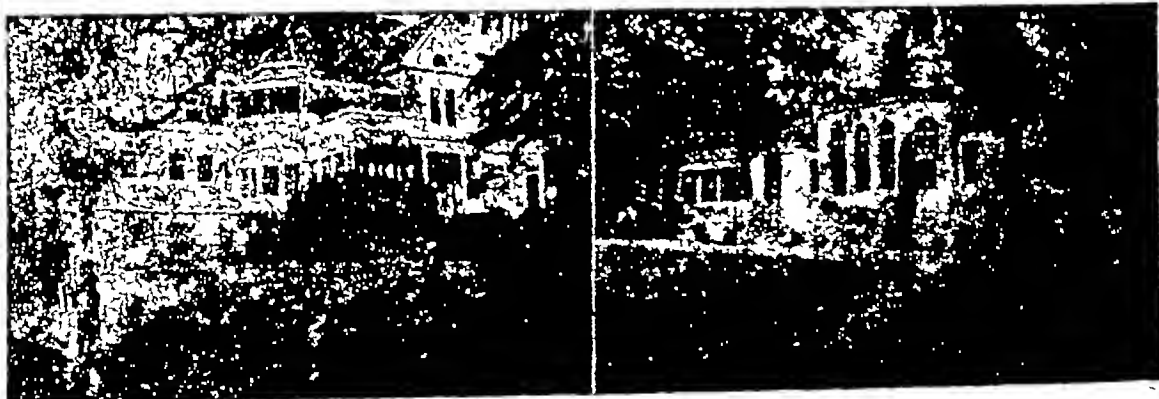
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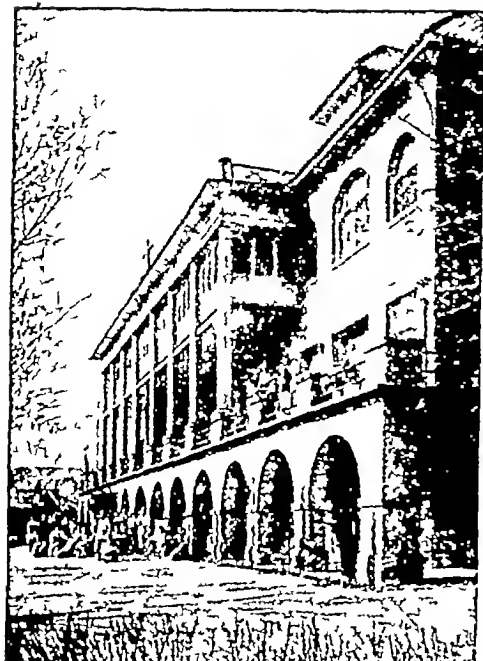
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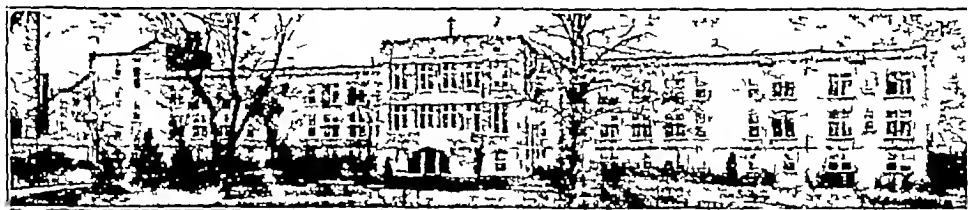
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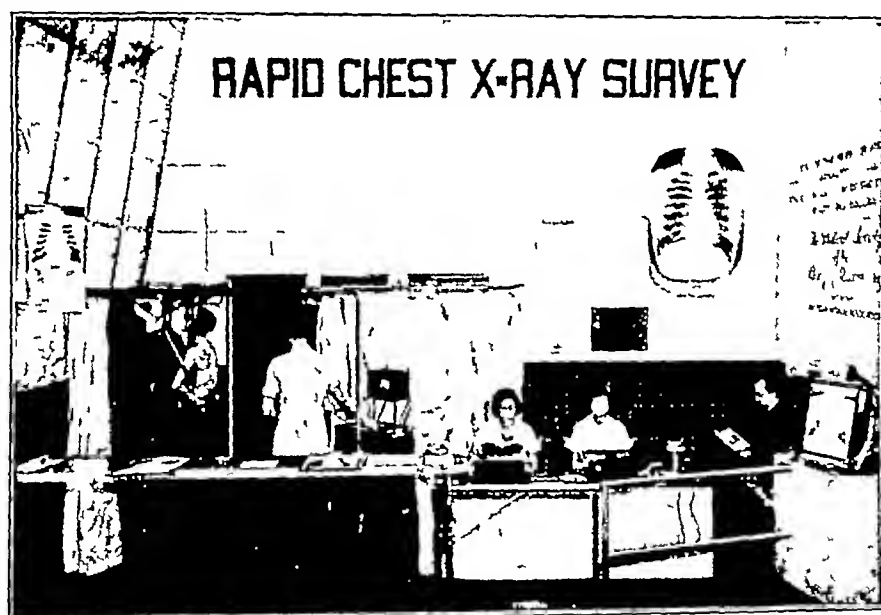
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Editorial Comment

Shall we Spread or Eliminate Tuberculosis in the Army?

Our fighting forces are routinely examined physically and clinically for practically every serious defect except the most important one—most important for two reasons—first, because it is the most costly to the government and second, because it is the most deadly of all diseases in the age range of our fighters, from eighteen to forty-five

It was very impractical economy to spend from one to several dollars each for a thirty minute medical and physical examination of four million fighting men, as we did in World War I, and to include no adequate provision for keeping tuberculous persons out of the military forces, only to spend a round billion dollars during the first twenty years thereafter for disability compensation and for hospitalization for tuberculosis

Had it been possible and practical (which it was not) in 1917 and 1918 to x-ray the chests of all recruits, and of the entire military personnel, and so to have eliminated active cases of tuberculosis, this enormous bill would have been but a fraction of its present size—and the total is still growing at the rate of something like three million dollars a month—a sum sufficient to make a full 14x17

chest x-ray by the modern rapid paper film method, of the entire four million men in our World War forces

When almost every active public health agency in the country, including more than two thousand anti-tuberculosis organizations affiliated with the National Tuberculosis Association, schools and colleges, many state departments of health, including the U S Public Health Service, are stressing and actively promoting the EDC (Early Diagnosis Campaign) throughout the country, the one organization which has more millions at stake than any other organization or agency or group in this or any other country, is "letting the matter ride"

If it's "good business," as has been amply proven over and over again for a city, a county, or a town, to go out and hunt for, and find, and segregate, and treat, cases of tuberculosis among its adult population, how much "better business" it would be for Uncle Sam to eliminate active tuberculosis from his military forces

Once a recruit is finally accepted and has entered upon regular duties in the armed forces of our military establishment in time of war, the government, by law and by established practice, becomes the guardian of that individual to the end of his life, and some of

his dependents to the ends of their lives

In selecting recruits, the primary object is to pick men *fit for the service*. A case of tuberculosis or of heart disease, whether incipient, moderately advanced, or far advanced, is not *fit for the service* by any standard. Yet we have never made adequate efforts to exclude these diseases either from the ranks or from the command of our forces. Until every individual has a chest x-ray, there is always the possibility—in fact there is a strong probability—that somewhere between one-half of one per cent and two per cent have either tuberculosis or cardiac abnormality or both, to a degree requiring attention or further investigation, without which they should not take on the strenuous life of a soldier or sailor.

Canada is now x-raying the chest of every recruit before final acceptance. Not only do they x-ray recruits upon enlistment, but they will again be x-rayed upon discharge.

Tuberculosis among Canadian World War Veterans has cost the Canadian Government over a hundred million dollars in disability compensation.

Do we intend, in this emergency, to put tuberculosis victims into our army so that they can infect their tentmates and buddies while they are in the service and later to fill our hospitals and sanatoria and add another billion dollars to our compensation costs? It need not be, it must not be.

F W B

State Chapters of the College

In New York, at the 1940 Convention, there was ratified a change in the Constitution and By-Laws, which permits the granting of charters to State groups of Fellows of the College. It is stipulated that a meeting of such State Societies must be held at the time and place of the Annual Convention of the corresponding State Medical Society.

Three states have already organized. Chapter No. 1 is Illinois, No. 2 is New York and No. 3 is New Jersey. Pennsylvania is expected to organize at the time of the Convention of the State Medical Society in Philadelphia in October.

There are to be no dues in State Chapters.

F W B

Associate Membership in the College

Associate Membership in the American College of Chest Physicians was established by addition to the Constitution and By-Laws of the College at the 1940 Convention. Doctors who have been working or training in pulmonary diseases for two years are eligible to apply for Associateship. They are required to pay the established \$10.00 yearly dues, but no initiation fee. They must qualify and apply for Fellowship within 5 years, or their Associateship will be terminated.

Doctors wishing to apply for Associateship may secure application forms from the Chairman of the Board of Regents, Doctor Frank Walton Burge, 1930 Chestnut Street, Philadelphia, Pennsylvania.

F W B

Initiation Fee in the College

The Regents and Governors of the American College of Chest Physicians in joint meeting at New York City on June 8th, 1940, unanimously voted to raise the initiation fee for admission to Fellowship in the College, from \$25.00 to \$50.00 on January 1st, 1941. Increase to \$100.00 on January 1st, 1942, is contemplated, as it is believed that the enormous amount of work required to build the College will be completed by that time, and ample opportunity will have been afforded qualified chest specialists to secure Fellowship.

F W B

We Need More Mineral Counties

From Paul C. Rouzer, Superintendent of Schools, comes the very heartening statement that no teacher, janitor, bus driver, administrator or other employee of the Board of Education of the County of Mineral, West Virginia, has tuberculosis. What a great thing it would be, indeed, if there were many more Mineral Counties, and what a complete triumph for the hosts flying the banner of the double-barred cross if there were only such counties. No longer is it, as formerly, complacently accepted that universal infection exists. Except in the very congested metropolitan areas, the incidence of infection, as shown by the tuberculin test, is well below fifty per cent in

(Continued to page 210)

Chronic Bronchitis

CHAMP H. HOLMES, M.D., F.A.C.P.

Atlanta, Georgia

Introduction

With improved and improving methods of investigation and diagnosis, the ranks of pure chronic bronchitis are gradually thinning. Heretofore, there have been included in this category many instances of bronchiectasis, mycotic disease, the bronchial disturbance associated with asthma and other allergic manifestations, intra-bronchial growths, tracheo-bronchial tuberculosis and other disorders. A weakened myocardium may cause persistent rales at the lung bases, and the condition mistaken for chronic bronchitis. With the proper recognition and treatment of the failing circulation, the "bronchitis" (passive congestion) clears.

Even with the separation of the several entities, chronic bronchitis still remains something of a heterogeneous group. A large percentage of the cases of chronic bronchitis have been proved, in recent years, to be cases of mild bronchiectasis. This has largely come about through bronchography—the making of x-ray films after the introduction of an opaque medium into the bronchi. An iodized oil is the medium usually employed for this purpose. The dilated bronchi, the cylindrical and saccular dilatations, are readily revealed in these bronchograms, whereas their presence could not be detected on the films as ordinarily made. Included also in this group are cases of bronchitis with special characteristics, such as fibrinous bronchitis, purulent bronchitis, membranous bronchitis, etc.

Chronic bronchitis most often results from the structural and pathological changes incident to repeated and recurrent attacks of acute bronchitis. The association of infection in the upper respiratory tract with infection in the bronchial tubes is extremely common. This is notoriously true of infection of the para-nasal sinuses. It may be emphatically stated that no case of a chronic bronchial disorder has been competently studied unless an examination of the sinuses has been made. In many, many instances, the sinus disease is the fountain head of the infection in the bronchi, and little headway can be made in

the treatment of the latter until the former is eradicated. In children, infected adenoids and tonsils are often associated with, and responsible for, the bronchitis.

A chronic or recurrent bronchitis is a frequent accompaniment of chronic lung affections. The author has seen many cases of pulmonary tuberculosis with an accompanying benign bronchitis. Emphasis must be placed upon the word *benign*, in sharp contrast to the very serious tracheo-bronchitis which is due to an invasion of the bronchial tubes by the tuberculosis. In the consideration of a chronic bronchitis in association with pulmonary tuberculosis, it would be important to make the differentiation. The diagnosis of tuberculous tracheo-bronchitis usually demands a bronchoscopic examination. The course of the tuberculosis does not seem to be particularly unfavorably influenced by the benign variety. The chief difficulty, rather, seems to fall to the lot of the physician. He must determine how much of the cough, wheezing and expectoration is due to the bronchitis, and how much is due to the tuberculosis. Sputum and x-ray examinations are very valuable in this connection.

As with acute bronchitis in measles, so it is with recurrent bronchitis in asthma. It is part of the affection. High pitched squeaks at the end of expiration are a characteristic finding in asthmatic bronchitis, and when heard, should direct the physician along this path of inquiry.

Chronic bronchitis is particularly prevalent among the elderly. It is usually the cause of the winter cough and the frequent chest colds in changeable weather. Over-exertion, getting overheated followed by a sudden cooling off, or subjecting the body to any decided temperature changes, provokes an aggravation of the symptoms. For years, the bronchitis may be manifest only in the winter months, with a return to an apparently normal state in the summer. With succeeding years, the bronchitis becomes increasingly severe and persists for a longer time after the advent of summer, until a time may be

reached when it remains around the calendar. Simple chronic bronchitis is not a common ailment in young people.

The bronchial irritation seen in the excessive and habitual smoker is a condition that, to the author's way of thinking, has not been sufficiently stressed. For a long time the so-called "cigarette cough" was largely considered to be the erroneous explanation proffered by the patient who was, in reality, afflicted with pulmonary tuberculosis. Of course this is the case only too frequently, particularly regarding the slight hacking cough, but it is to be emphasized that there is a true smoker's cough. With the advent of an increasing number of women smokers, the condition is definitely on the ascendency, and it would appear that it is more prevalent among them. This may be due to the fact that they have only recently been emancipated from the shackles of convention, and indulge in the weed with less tolerance and, perhaps, with less discretion. It is a common sight to see a woman light a fresh cigarette from the one just consumed. This is a comparatively uncommon thing for a man to do. The pathological state is a bronchial catarrh, and is characterized by cough and the production of considerable muco-purulent sputum. This sputum is usually grey, or greyish-black due to the contained carbon. It may at times be expectorated in the form of small balls or bronchial casts. This productive cough occurs off and on, at any time, but is greatest during the evening and during the first hour or two in the morning after arising. The condition usually responds favorably to the control of the smoking habit, and in proportion to the degree and effectiveness with which this control is applied. To obtain the best results, a removal from the smoke-laden cities may be necessary.

Symptoms and Course

Chronic bronchitis usually results from repeated attacks of acute bronchitis which have become more frequent and more prolonged. There occurs a transitional phase which may be nicely called sub-acute bronchitis. This partakes of the characteristics of both the acute and chronic bronchitis. In some instances, the disease may be chronic from the beginning. Except when complications arise, chronic bronchitis is rarely fatal. A duration

of ten to twenty years, or more, is not uncommon. The disease may be quite mild, and little impairment of the health may be experienced, other than temporary disability at the time of acute exacerbations. In other cases, it may be more severe and result in invalidism and confinement within doors for months at a time. Bronchiectasis, marked emphysema and failure of the right heart, are the more common complications. These may, in turn, produce symptoms of a severe or urgent nature.

Cough is by far the most common symptom of chronic bronchitis, being practically a constant accompaniment. The winter cough, in mild cases, may be about the only symptom. The winter cough of elderly people falls into this category. Sudden changes in the weather, exposure, contact with irritating dust and gases, may provoke attacks or periods of coughing. Over-exertion, getting overheated, and even loud talking and laughing may be followed by a paroxysm of cough. It is regrettable that such a wholesome thing as a good hearty laugh should be penalized. Surely, every reader can recall the jolly rotund individual, perhaps with just a flare for the cocktail and cigar, laughing himself into a fit of coughing, accompanied by a violaceous suffusion of face and neck and shortness of breath.

The expectoration in chronic bronchitis varies tremendously, both in character and amount. There is a rather troublesome type of chronic bronchitis with no expectoration, or at most only a small amount of tenacious mucous. It has been called dry bronchitis, or the catarrh sec of Laennec. In other cases, there is a bronchorrhea with the production of a copious, thin expectoration. Usually, the expectoration in chronic bronchitis consists of a moderate to a considerable amount of frothy mucoid or muco-purulent sputum. Large amounts of purulent sputum suggests bronchiectasis or lung abscess, rather than chronic bronchitis. There is no odor to the sputum in the uncomplicated cases of bronchitis. Likewise, coughing up blood is rarely seen in pure bronchitis. A few blood streaks in the sputum may result from a very severe spell of coughing. The presence of blood in the expectoration, in either large or small amounts, suggests the existence of some other disorder. Except in the acute exacerbations

and in the presence of complications, chronic bronchitis runs an afebrile course. Dyspnoea, in some degree, is present in most cases of chronic bronchitis. In the early phases of the disease, breathlessness may be occasioned only by exertion. Later in the course of the disease, it becomes more readily provoked and more pronounced. In chronic bronchitis of long standing, the dyspnoea is usually due to the associated emphysema and to strain upon the right heart.

There is little or no derangement of the gastro-intestinal tract in chronic bronchitis. The appetite may be impaired in some cases, but as a rule it is not. Eating may precipitate a coughing spell, and vomiting is not uncommon after such a spell. There is rarely any loss of weight from the effects of chronic bronchitis, but rather, the imposed sedentary life often results in a weight gain. Chest pain is uniformly absent. Even the sub-sternal discomfort and rawness of acute bronchitis is not experienced.

Diagnosis

The important thing in the diagnosis of chronic bronchitis is the differentiation from other chest disorders which may produce a chronic cough. It is a fairly safe assumption that in the case of an individual who has had a chronic productive cough over a period of years, and in whom there has been little impairment in the general health, that one is dealing with a chronic bronchitis. This is particularly true where the evolution of the disturbance has been from frequently repeated chest colds. If then, the physical signs are few or consist of scattered mucous and sibilant rales, the probability of this diagnosis is considerably enhanced. The diagnosis is safely established when examination fails to reveal any evidence of the other more specific diseases in which a chronic cough may be a dominant symptom. The chief ones in this group are tuberculosis, bronchiectasis, pulmonary mycosis, pneumoconiosis, lung abscess and bronchogenic carcinoma. Epoch-making advances in the differential diagnosis in broncho-pulmonary diseases have been made by lung mapping following iodized oil injections.

More and more in recent years, the bronchoscope has come into its own, and has taken an important place among the diag-

nostic procedures. Its employment has also contributed to the reduction in the diagnoses of chronic bronchitis. Bronchoscopy is indicated in all atypical or obscure broncho-pulmonary disorders, and may prove, in many instances, the cause to be a growth, a foreign body or perhaps a suppurative process. Not infrequently, a case of so-called chronic bronchitis will prove to be circulatory in nature. If the weakness or failure in the pulmonary circulation is repaired, the bronchitis improves or disappears.

Wherever any chronic pulmonary disorder exists, pulmonary tuberculosis must be kept in mind. Usually, a chronic cough for a number of years, with little or no impairment of the general health, is not due to tuberculosis. It may be, however. Tuberculosis, as Syphilis, is a great imitator, and unless it is kept in mind, many cases will be missed. The late Dr Lawrason Brown is credited with the dictum "The most important factor in diagnosis in the majority of cases of pulmonary tuberculosis is keeping the disease in mind."

In the examination of adult contacts of children with a positive tuberculin test, the "bronchitis" of the parent, uncle or grandparent may be shown to be tuberculosis. In every case of chronic cough, it is an excellent rule to make an x-ray of the lungs and to repeatedly examine the sputum.

Treatment

The prevention of exacerbations is one of the most important phases in the management of chronic bronchitis. In a large measure, this is accomplished by keeping the patient indoors during the changeable weather of winter and spring. The sojourn in a suitable climate during the fall and winter months, if the patient can afford it, is very helpful. The sunny climes of Florida and the south-western part of the United States, seem to be excellent for this purpose. For the milder cases, and the more rugged individuals, a high dry climate such as the Rocky Mountain area, seems well suited. The low humidity is a beneficial factor. The elderly, and those with a severe disturbance, however, do not tolerate the high altitudes well. Many cases with scant or no expectoration, experience relief at the sea coast. The sufferers from chronic bronchitis should always dress warmly, and not change from their heavy underclothes until

warm weather is definitely established

Drugs play only a minor role in the treatment of chronic bronchitis, and probably no case is ever cured by them alone. Tonics of various kinds may aid, such as those containing iron, arsenic and strychnine. In the young and poorly nourished, cod liver oil is helpful and may be given throughout the fall and winter seasons. Many of the vitamin preparations, with which the market today is flooded, are probably helpful, particularly those containing vitamins A and D. Calcium has its advocates and apparently is given with benefit in some of the wheezy and allergic cases. The writer finds di-calcium phosphate, in doses of grs. XV three times a day, a satisfactory preparation. In those cases with emphysema and a weak myocardium, small doses of digitalis and strychnia are serviceable. Anodynes, such as codiene, are to be avoided, since their use in so chronic a disorder can possibly invite addiction. At times, in severe episodes they are necessary for relief. Numerous expectorants are prescribed in chronic bronchitis, and their selection should depend on the amount and character of the expectoration. None should be used over any protracted period. One of the best expectorants is potassium or sodium iodide in 2 to 5 grain doses 3 to 4 times a day. Watchfulness for an idiosyncrasy or sensitiveness to iodine should be observed. Ammonium chloride or carbonate is useful where the secretions are scant or tenacious. The following is an old, tried and proved formula

Ammonium chloride 3 (or drams) VI
Brown Mist qs 3 (or ounces) VI
M Sig —one teaspoonful q 3 hrs

The alkaline expectorants, for example the acetate and citrate of potassium, are quite helpful, and may be given in hot water or milk. Given thus, in a hot drink on arising, they often prove most comforting to the patient. They are especially indicated in the gouty, rheumatic and obese individuals. For purulent, fetid and excessive secretions, the balsamic and mildly antiseptic preparations

are usually employed. The commonly used drugs in this group are creosote, eucalyptol, tar, guaiacol, benzoin and turpentine.

Medicated vapors, applied in various ways, are very popular in the general therapeutic management of chronic bronchitis. The methods of application range from the atomizer and mechanical inhaler to bits of filter paper, soaked in the medicant, placed about the sick room. Various breathing exercises and devices have been used to tone the musculature of the respiratory mechanism, to increase the tidal air, and to aid in the expulsion of secretions. Cold water douches on the chest, followed by vigorous rub-downs is another helpful measure. This, as well as other exercises, should be reserved for the mild cases or for remissions. Other procedures that have been employed in treating chronic bronchitis and which undoubtedly have some merit, are vaccines, heliotherapy and deep x-ray therapy. The cases must be selected.

For the best results in the habitual and excessive smoker, a sharp curtailment, or better, a complete abstinence from smoking is necessary. The complete disappearance of a chronic cough by this alone, has been observed many times.

Finally, there needs to be stressed the value of periodic injections of iodized oil into the bronchi. It has proved to be one of the most helpful therapeutic agencies in the author's experience. Five to ten c.c. of the oil are injected into each side every two to four weeks.

In the prophylaxis of chronic bronchitis, careful attention should be paid to such factors as proper housing, clothing, exposure and exercise. It is particularly important that proper attention be given to foci of infection in the sinuses, nose and throat. The association of infection in the sinuses with infection in the bronchial tubes is extremely frequent. The prompt and energetic treatment of the sinus infection may prevent many individuals from developing chronic bronchial disease, or may markedly alleviate the affection after it is established.

Schedule for Teaching Chronic Diseases of the Lungs in Medical Schools

As Outlined by the Committee on Undergraduate Education
Representing the American College of Chest Physicians

ED W HAYES, M.D., F.A.C.P.*
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This schedule was arranged on the basis that tuberculosis is not an acute disease. That is, it is not a disease of a few weeks, consequently, its diagnosis, treatment, prevention, and ultimate outcome cannot be understood by a short period of study. On the other hand, since this disease is characterized by many and varied changes for months and years, it must be taught to the students as it presents itself, that is over a period of months and years.

The schedule deals primarily with outlining a course for the study of pulmonary tuberculosis, since tuberculosis is the outstanding chronic disease from the standpoints of medicine and public health. The schedule, however, does allow opportunity for the student to obtain a working knowledge of other chronic diseases of the lungs. Again, the student who has been well grounded in tuberculosis will, as a physician, be lung conscious and will have an interest in, and an understanding of lung conditions in general.

A review of the work, carried on as it is at the present time, in the different medical schools, indicates that the bacteriology, pathology, and perhaps to a less extent, such other features of tuberculosis as immunology and allergy are being taught with a fair degree of satisfaction by most schools during the first and second years. There are some schools in which improvement in this particular work can be made through arranging the courses so as to call attention more specifically to these factors as they relate to tuberculosis.

An excellent practice carried out by some schools during the first or second year is the showing of some of the National Tuberculosis Association educational pictures such as "Behind the Shadows," "Let My People Live,"

"On the Firing Line," and "Cloud in the Sky." Pictures such as these may, and no doubt do, stimulate in some students, at least, an interest which they will maintain throughout their work.

The schedule specifically provides for 18 formal one-hour lectures covering the fundamentals of tuberculosis in a logical order and in as much detail as time permits. These lectures are to furnish the groundwork for the course in tuberculosis. They are to be given by an instructor specializing in the field covered by any particular lecture. It is suggested that nine of these lectures be given at the beginning of the course for the junior year and nine at the beginning of the course for the senior year. The remaining hours of the course are to be spent in informal periods to be spread over the last two years.

As part of the schedule, a special group of patients representing the various types of tuberculosis are to be selected from the teaching material at the beginning of both the junior and senior years. This group of patients is to be used for follow-up and repeated observation work throughout each year.

In the schedule it is suggested that the first part of the informal periods should be devoted to a discussion or seminar, the length of this time depending on the total amount of time allotted to the course in the particular school. During this discussion or seminar the instructor will be able to contact the student on a more or less individual basis and under conditions where there will be freedom from the ordinary tension of the classroom. During this part of the sessions, the work covered thus far in the course should be reviewed and the work yet to be taken up should be introduced in its logical order as suggested in the outline.

A second part of the informal period should be spent in seeing patients in chest clinics or sanatoria where diagnosis, case finding, and the sociological aspects should be par-

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ticularly emphasized. If the school is not fortunate enough to have a chest clinic or a sanatorium, this work may be carried on, though perhaps less satisfactorily, in special tuberculosis wards of public hospitals. This committee feels that the patients promiscuously placed in medical wards of public hospitals are in a situation that is obviously so out of keeping with the rational handling of pulmonary tuberculosis that, as teaching material, such patients are worse than no material at all, except perhaps to demonstrate certain more or less isolated factors. Under such conditions, the patient has little or no chance to overcome his disease and tuberculosis at its worst is being presented to the student. The usual reaction on the part of the student to attempts at teaching under such conditions is that he wants to avoid the disease as much as possible for the remainder of his life.

The final part of each informal period should be spent in reviewing the condition of those patients who have been selected for follow-up observation and study.

This schedule recognizes the importance of a student's spending some time, the amount depending again on the total time allotted for the course, with the nurse or physician or with both, in so-called field work, studying the sociological features and home treatment of tuberculosis.

Inasmuch as pulmonary tuberculosis continues to be such a serious health and medical problem and since its solution depends upon the man in the general practice of medicine, this schedule is arranged in an attempt to provide conditions in all our medical schools whereby graduates will be tuberculosis conscious and will have a lasting appreciation and practical working knowledge of the value and technique of early diagnosis, of the value and technique of an efficient case finding program, and of the value and technique of early and intensive treatment. Experience very definitely proves that if the general practitioner does not get such a training in school, there is very little likelihood that he will get it after graduation.

Is it not reasonable to expect that, if medical schools are to fulfill their place in our educational system, they should devote effort and time to the particular subjects in their curricula in proportion to the importance

of those subjects as medical and health problems?

Those who prepared this schedule are aware that the subject of tuberculosis comes up repeatedly, especially in differential diagnosis, in every branch of medicine and surgery taught in medical schools. They feel, however, that past experience has very clearly demonstrated that students cannot be taught a practical working knowledge of tuberculosis except through a definite, logically arranged system together with certain equipment by which teaching material can be furnished, and with teachers especially equipped through experience and training, and, finally, by an allotment of time to the subject equal at least to that suggested in the minimum schedule. The committee feels that tuberculosis may and should be included in the department of internal medicine but, if such is the case, it should have a sub-department. Experience again has very definitely demonstrated that unless such a plan is followed, the average student leaves school with very little more practical understanding of this disease than when he entered.

The schedule as outlined is arranged according to a minimum number of hours for the course. Suggestions are also made for a schedule with the maximum number of hours. The number of hours in this minimum schedule is 76—divided as follows: 12 hours during the first and second years, 19 hours during the junior year, and 45 hours during the senior year. The number of hours in the maximum schedule is 185—divided as follows: 24 hours during the first and second years, 45 hours during the junior year, and 117 hours during the senior year.

The hours suggested for the first and second years are to be spaced and occupied according to the discretion of those in charge.

It is felt that in an attempt to teach the subject in any school, the time allotment should at least equal that suggested in the minimum schedule. Obviously, there is no objection to exceeding the number of hours suggested in the maximum schedule.

One medical school which is widely known for the efficient manner in which it teaches the subject of tuberculosis allots a total of 500 hours to the teaching of this subject. Another school, rated among the ten which are now doing the most acceptable work in

the teaching of chronic diseases of the lungs, estimated that they devoted four per cent of the total teaching time to tuberculosis. For the minimum schedule which we have suggested the time is roughly two per cent, and in the maximum schedule, four and one-half per cent of the total teaching time in the average medical school.

The time suggested for the maximum schedule was arrived at by averaging the number of hours devoted to the subject in the ten schools which, by the questionnaires they returned, indicated the greatest number of hours devoted to this subject. In averaging the number of hours in the ten schools which indicated the least number of hours devoted to this subject we found that the average was so low that it would be entirely inadequate for the teaching of this subject, so an arbitrary number of hours was worked out for a minimum schedule.

The shortage of time allotted to the subject was more apparent than real in many of these schools, as they are attempting to teach this subject as a part of other courses, especially internal medicine.

Where the total amount of time allotted to the teaching of tuberculosis and other chronic diseases of the lungs in any school is greater than that in the minimum schedule, the same general plan that is suggested in the schedule should be followed, and more time can be devoted to the various phases of the subject and additional informal sessions can be held. In the junior year, with more time, the work could perhaps be spread over the whole year and be given in two-hour periods twice a month or four-hour periods once a month.

If in attempting to put this schedule into operation in any particular school, only one instructor is available, the committee feels it would be better for him to carry the class along as a whole rather than break it up into sections and meet each section only a few times over a short period. As has already been stated, tuberculosis cannot be taught to students in a short period of time. If the one instructor should have the time, the class could be divided into smaller sections and he could then meet the different sections on different days of the month or week, as the case might be, as determined by the total amount of time allotted for the course. Under

this system it is obvious that more satisfactory teaching could be done than where the instructor meets the whole class at one time.

Where a number of competent instructors are available, it is better to break the class up into sections of from six to fifteen. The smaller the group, the more individual attention can be given to the student and, consequently, the better the teaching.

As to clinical clerkships, this is a good method of teaching tuberculosis, if used as a supplement to the course as outlined in this schedule. If used as the principal means of teaching this subject, we are again confronted with the problem of trying to teach a chronic disease in a few weeks.

The committee urges that all students, on entering, be tuberculin tested and those reacting positively be x-rayed then and at the beginning of each school year. It further urges that the tuberculin tests be repeated at the beginning of each year on all those who had a previous negative reaction and, if and when they become positive, that they be x-rayed then and at the opening of each remaining year of school.

In conclusion, it is obvious that the successful operation of the suggested schedule necessitates certain requirements, namely, equipment by which adequate teaching material will be furnished, the best form of this equipment being out-patient chest clinics and sanatoria, and acceptable, but less satisfactory, tuberculosis wards in public hospitals where these wards are conducted under intelligent supervision and, as far as possible, with a sanatorium atmosphere. There must also be available teachers who through training and experience are competent to teach the subject.

In presenting this plan your committee realizes that some medical schools will have to take their teachers as they come, and that lack of experience, as well as lack of adequate equipment and teaching material, will be a serious handicap in the case of at least some schools. It is hoped, however, that the method of teaching suggested will stimulate improvement along these lines.

Your committee also feels that this proposed plan is sufficiently rigid to induce instructors, who may be lacking in experience and vision, to follow a more or less definite procedure and at the same time it will permit

Diabetes
Typhoid Fever
Hodgkins' Disease
Various Secondary Anemias
The Leukemias

Lect II—Differential Diagnosis When X-ray and Physical Findings are Moderate or Marked, the Following Conditions to be Considered—to be given by a chest specialist

Bronchiectasis
Lung Abscess
Pulmonary Syphilis
Pneumoconiosis
Foreign Bodies
Benign or Malignant Tumors
Mediastinal Tumors
Actinomycosis
Blastomycosis
Coccidioid Granuloma
Aspergillosis
Hyatid Disease
Pulmonary Distomiasis
The Pneumonias
Pleural Effusion

Lect III—Prognosis in Pulmonary Tuberculosis —to be given by a chest specialist

General Considerations
Depends Primarily on Manner of Treatment
Clinical Types
Relative Value of Physical Signs and Symptoms
Complicating Disease Conditions
Non-tuberculous Pulmonary Complications
Extra-tuberculous Involvements
Other Factors
Prophylaxis,
 Introduction
 The Sputum
 The Open Case
 Prophylaxis in Childhood
 Acquired Artificial Immunization
 Marital Tuberculosis
 The General Hospital in Care of the Tuberculous

Lect IV—Treatment of Pulmonary Tuberculosis —to be given by a chest specialist

Economic Factors
Home Environment,
 General Considerations
Personal Hygiene
Non-Surgical Rest, Exercise and Occupation
 Rest,
 Methods of Obtaining
 Rest and Exercise
 Graduated Exercise
 Future Occupation
Diet,
 General Considerations
 Obesity and Tuberculosis
 The Menu
 Special Diets

Salt Restricted Dietaries in Tuberculosis,
 Characteristics
 Theoretical Foundations
 Clinical Results
 Practical Applications
 A New Modification
 Mechanism
 Conclusions

Lect V—Treatment of Pulmonary Tuberculosis (Con't)—Medicinal, Symptomatic, and General Therapy—to be given by a chest specialist

Specific Therapy,
 Metallic Salts
 Calcium
 Vitamin D
 Creosote and Gulacol
 Iodine
 Liver Extract
Treatment of Symptoms
Tuberculin Therapy,
 Varieties of Tuberculin
 Indications
 Contra-indications
 Technic

Heliotherapy,
 Physical Properties of Light
 Biologic and Physiologic Effects of Light
 Light Sources
 Technique of Exposures
 Clinical Applications of Heliotherapy
Climate Therapy,
 General Considerations
 Favored Localities
 Climate and Extra-pulmonary Tuberculosis

Lect VI—Treatment of Pulmonary Tuberculosis —(Con't)—Artificial Pneumothorax—to be given by a chest specialist

Introduction
Historical
Mode of Action
Indications
Contra-indications
Selection of Cases
Technique and apparatus
Control of the Pneumothorax
Complications
Pleuritic Adhesions
Influence on Contralateral Lung
Influence on Symptoms
End-Results of Treatment
Classifications of Pneumothorax Character
Summary

Lect VII—Treatment of Pulmonary Tuberculosis —(Con't)—to be given by a chest surgeon

Intrapleural Pneumolysis,
 Limitation
 Indications for Operation
 Contra-indications
 Selection of Cases
 Surgical Anatomy

- Pleuritic Adhesions
- Operative Technique
- Complications
- Result of Treatment
- Conclusions
- Oleothorax,
 - Indications
 - Contra-indications
 - Technique
- Pneumothorax Pleuritis
- Complications
- End Results
- Phrenic Neurectomy,
 - Indications
 - Operative Procedures
 - Choice of Operations
 - Complications
 - Clinical Effects
 - Results
 - Summary and Conclusions
- Lect VIII—Treatment of Pulmonary Tuberculosis—(Con't)—to be given by a chest surgeon
- Extra Pleural Thorocoplasty,
 - The Evaluation and Principles of Treatment of Cavities
 - Indications
 - Surgical Procedures,
 - Technic
 - Post-operative Treatment
 - Complications
 - Results
- Lect IX—Treatment of Other Chronic Diseases of the Lungs by Surgery—to be given by a chest surgeon
 - Indications
 - Techniques

**FOURTH YEAR INFORMAL SCHEDULE
ACCORDING TO MINIMAL NUMBER
OF HOURS ALLOTTED**

I Four-hour teaching period each month

- 1 First 4-hour period,
 - a Teaching to be done in out-patient chest clinic, a sanatorium, or as a last choice, a tuberculosis ward of a public hospital
 - b First half-hour or hour to be spent in reviewing by means of seminars or discussions differential diagnosis of chronic lung conditions
 - c Next $1\frac{1}{2}$ to $2\frac{1}{2}$ hours students under close supervision of instructor to study patients from standpoint of differential diagnosis based upon history, physical examination, chest x-rays, laboratory findings, and, if necessary, the clinical course
 - d Remainder of the period—not less than one hour—devoted to selecting a group of patients, from 6 to 12 or more, in a sanatorium or on the cure somewhere who will represent the various stages and types of tuberculosis and who are to be

followed on the cure throughout the year by being seen and studied each month

Note At the outset every effort should be made to acquaint the students with all the different phases of each case, including their temperament and disposition. Hereafter, we will refer to these patients as "the patients under continuous, prolonged observation"

2 Second 4-hour period,

- a First $\frac{1}{2}$ to 1 hour devoted to further discussion or seminar on differential diagnosis of pulmonary tuberculosis pointing out especially the differential diagnosis of primary and secondary tuberculosis
- b $1\frac{1}{2}$ to 2 hours during which students study patients from the standpoint of differential diagnosis under close guidance and supervision as was done in the last period. The work should be arranged so that cases of primary tuberculosis are available for study
- c During the last hour the time should be spent under close guidance of the instructor in observation and study of the patients under continuous, prolonged observation

3 Third 4-hour period,

- a *First hour* Discussion or seminar on the prognosis of pulmonary tuberculosis
- Note* Importance of mental and emotional control of the patients in determining the prognosis should be stressed
- b Two hours spent in studying patients in out-patient clinics, sanatorium, or tuberculosis wards who have been on the cure for a considerable time

Note An attempt should be made to correlate the various phases of tuberculosis and to point out their bearing on the prognosis as well as to make clear the uncertainty of definite prognosis in the disease

- c One hour to be spent with the "patients under continuous and prolonged observation"

4 Fourth 4-hour period,

- a One to two hour discussion or seminar on the treatment of pulmonary tuberculosis

Note The factors involved in the so-called dietetic, hygienic, rest regimen and home versus sanatorium treatment should be the topics for consideration

- b One to two hours spent in observing and studying patients either in an out-patient clinic, a sanatorium, or a special ward for tuberculous patients who are either on the "cure" or who have left the "cure" and are being followed up
- c One hour spent with "the patients under continuous, prolonged observation"

5 Fifth 4-hour period,

- a One to two hours in discussion or seminar on the medicinal and symptomatic treatment of tuberculosis and the consideration of climate and heliotherapy in connection with the treatment of this disease
- b One to two hours to be spent in observation and study of patients who are on the "cure" and who have left the "cure" with special reference to the above named factors
- c One to 1½ hours (depending on the amount of time left) devoted to the "patients under continuous, prolonged observation"

6 Sixth 4-hour period,

- a 3 to 3½ hours during which students are to accompany public health or visiting nurses, with the instructor when possible, out into the community where they will have an opportunity to observe case-finding, home treatment and social aspects of tuberculosis
- b Time should be arranged so that the "patients under continuous, prolonged observation" may be seen, if only for a short time, so as not to lose continuity of observation and the interest of the student

7 Seventh 4-hour period,

- a 1½ hours discussion or seminar on pneumothorax, intrapleural pneumolysis, oleothorax, phrenic neurectomy, and closely allied surgical procedures used in the treatment of pulmonary tuberculosis. The treatment of tuberculous empyema should be included in this discussion
- b 1½ hours for the study of patients either in an out-patient chest clinic, in a sanatorium, or in a special tuberculosis ward of a public hospital who have received the above types of treatment
- c The fourth hour is to be spent with the "patients under continuous, prolonged observation"

8 Eighth 4-hour period,

- a One to two hours for discussion or seminar on thoracoplasty and its various modifications. A discussion of other surgical procedures used in the treatment of pulmonary tuberculosis and not already covered in the course should be included. Brief reference should be made to such surgery on non-tuberculous pulmonary conditions that has not been incidentally covered in the past
- b One to two hours for study of patients in out-patient chest clinic, a sanatorium, or in a special tuberculosis ward of public hospital of patients who have received the type of treatment under consideration during this period
Teaching the student the technique of these operations is not so important as is the teaching of the possibilities that can be obtained by carefully selected, ably operated cases
- c The fourth hour to be spent with the "patients under prolonged, continuous observation"

9 Ninth 4-hour period,

- a Two hours of discussion or seminar covering a summary of the work during the medical course on tuberculosis

Note During this session the students should be made to realize that they are not supposed to be specialists in chronic diseases of the chest but that they should be tuberculosis conscious. They should also be made to understand that tuberculosis is a possibility in every case that may consult them and that their responsibility will rest in their demonstrations of their appreciation of the technique and value of an efficient case-finding program, and the technique and value of early, intensive treatment

- b Two hours to be devoted to the study of the "patients under continuous, prolonged observation" from the standpoint of original diagnosis, treatment, and clinical course to date

WE NEED MORE MINERAL COUNTIES—Continued from page 198

most age groups throughout the country. Indeed, in many rural and sparsely populated areas, twenty-five per cent would be a rather high figure.

To prevent infection by the tubercle bacillus is today one of the staunchest planks in our platform for tuberculosis control. It has been stated recently by an outstanding observer that 8 to 10 per cent of all those infected, ultimately die of tuberculosis. The infected

child of today is the sick open case of tomorrow. These children are infected in most instances by their usual adult contacts. These contacts in a large measure are found among parents, school teachers, domestic servants, janitors, etc.

Congratulations Mineral County of West Virginia. We need more like you.

C H H

Cerebral Air Embolism, Subcutaneous Emphysema, and Spontaneous Pneumothorax in a Tuberculous Patient

Report of an Unusual Case*

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A review of the literature makes it evident that the simultaneous occurrence of spontaneous pneumothorax, subcutaneous emphysema, and air embolism complicating pulmonary tuberculosis is a rare condition. Such a condition is reported in detail, not only because of its rarity, but also because of its physiological and pathological interest.

Bruns in 1930¹, reports a study of sixteen cases of air embolism with seven deaths in 12,700 therapeutic pneumothorax treatments. McCurdy in 1934², reports one case of air embolism following a therapeutic pneumothorax. Hamilton and Rothstein in 1935³, report nine cases of air embolism following therapeutic pneumothorax in their large series of cases. Anderson in 1936⁴, states that the incidence of air embolism in therapeutic pneumothorax is one in every 1000 to 2000 refills. He goes into a detailed description of the symptoms, signs, and pathology of the condition. Hartley and Yorkoff in 1938⁵, report in detail two cases of air embolism, and Blumberg in 1933⁶, 3 cases in patients receiving therapeutic pneumothorax. Chase in 1934⁷, quite definitely proved the existence of air embolism by his striking experiments.

Dobbie in 1936⁸, Chenebault and Marre in 1938⁹, and Aznarez in 1938¹⁰, report one case respectively of subcutaneous emphysema and spontaneous pneumothorax complicating pulmonary tuberculosis.

Myers, Levine, and Leggett in 1938¹¹, presented a comprehensive paper on the subject of air embolism and spontaneous pneumothorax complicating artificial therapeutic pneumothorax, but they cited no incidence where air embolism, subcutaneous emphysema, and spontaneous pneumothorax oc-

curred simultaneously in a patient not receiving pneumothorax therapy.

Clinical Abstract

The patient, C. G., a 41 year old male negro prisoner was admitted on March 6, 1939, complaining of

1 Cough, 2 Loss of weight, 3 Expectoration, 4 Hemoptysis, 5 Weakness.

History of Present Illness. The patient states that he was quite well until September, 1938, when he began to cough, lose weight, and feel weak. The cough persisted, became worse, and productive of white sputum. On occasions, the sputum was bloody. He showed breathlessness on exertion for three months and night sweats for two weeks. He has been unable to do any work for one month because of weakness. There has been a known loss of twelve pounds in weight in the past three weeks.

Family History. No tuberculosis.

Past Medical History. Essentially negative.

Habits. A heavy drinker and smoker.

History by Systems. Essentially negative.

Physical Examination. The pupils react to light and accommodation. The extra-ocular muscles function normally. Percussion of the chest shows impaired resonance over the right upper lobe area anteriorly and posteriorly. There are many squeaky rales through out both lungs, most marked over the right upper lobe area. Blood pressure is 108/70. There is no enlargement of the heart or abnormality of sound or rhythm. The residual portion of the physical examination was essentially negative.

Impression. Pulmonary tuberculosis bilateral far advanced with cavitation of the right upper lobe.

Roentgen Examination. 3/5/39. Irregular density and mottling over entire right lung field. Numerous radiolucent areas due to cavi-

* From the Service of Dr. Nathan Blumberg, The Philadelphia General Hospital, Philadelphia, Pa., August, 1939.
Necropsy by Dr. William Ehrlich, Visiting Pathologist at the Philadelphia General Hospital.

tation Early bronchogenic spread to middle portion of left lung Heart not enlarged or displaced

Impression Fibroulcerative tuberculosis—right

Laboratory Sputum negative for Tubercle Bacillus Kahn negative Blood Sugar 77 mg % Blood Urea 10 mg %

Progress Notes

3/10/39—Therapeutic Conference Treatment to be bed rest for the time being

5/4/39—Therapeutic Conference Advised therapeutic pneumothorax on right

5/18/39—On three separate occasions artificial pneumothorax attempted, but no pleural space could be found, and therefore was discontinued Patient was placed on bed rest

6/19/39—Patient developed a generalized edema of the face, back, penis, and ankles The abdomen was distended with fluid The liver was not palpable, there was no venous engorgement, and the cardiac examination was negative Blood Pressure 105/70 He also complained of nocturia 4-5 times

Laboratory Urine—albumen 3 plus, hyaline and granular casts

Blood RBC 3,980,000, Hemo 9.5 gm, WBC 23,700, Polys 60, Lymph 34, Mono 2, Eosin 4 Total Protein 4.1, Album 2.3, Glob 1.8, A/G 1.2 Congo Red test showed disappearance of the dye to be 70 per cent

Impression 1 Nephrotic syndrome, 2 Amyloid disease of the kidneys, 3 General amyloidosis, 4 Chronic far advanced pulmonary tuberculosis

Therapy Restrict fluids, no salt, high protein diet, mercupurin

7/14/39—Edema has entirely disappeared Patient's general condition seems improved Mercupurin stopped, but continued on low fluids and salt restriction

7/24/39—At 6 30 p m the patient was found leaning against the wall in the bath room He was in a confused state He was placed in bed by the nurse Examination at 6 45 p m revealed a stuporous patient lying quietly in bed experiencing some difficulty on inspiration The respiratory rate was not increased He responded slowly to questions and did not complain of pain Physical examination showed extensive subcutaneous emphysema over the right anterior chest, neck, face, right arm, and right leg Crepitation was felt

in all these areas There was marked ballooning of the scrotum It measured 20 cm in diameter and was tympanitic on percussion The chest was hyper-resonant throughout, even over the precordial area The left pupil was relatively enlarged, neither pupil reacted to light or accommodation There was a horizontal nystagmus The right arm and right leg showed a complete motor paralysis of all muscles The tendon reflexes were absent and there was a positive Babinski on the right

Impression 1 Spontaneous pneumothorax, 2 Subcutaneous emphysema, 3 Right hemiplegia due to air embolism to left cerebral area

7/25/39—*Neurological Consultation* Patient shows right hemiplegia, partial aphasia, and no hemanesthesia

Impression The sudden appearance of right hemiplegia with subcutaneous emphysema and evidence of massive collapse points to air embolism as a causative factor of this patient's hemiplegia Cerebral thrombosis must be ruled out however

7/25/39—*Roentgen Examination* There is extensive subcutaneous emphysema throughout the tissues of the neck and thorax Considerable irregular density over the entire right lung and probably a pneumothorax on this side No definite involvement on the left side at this time Heart is not displaced

Impression Extensive subcutaneous emphysema with spontaneous pneumothorax

7/26/39—Spread of emphysema over the left thorax and left leg Blood Pressure 80/60

7/28/39—Patient gradually becoming more stuporous Death

Clinical Diagnosis 1 Pulmonary tuberculosis bilateral far advanced with cavitation of the entire right lung, 2 Amyloid disease of the kidney, 3 General amyloidosis, 4 Spontaneous pneumothorax right, 5 Subcutaneous emphysema, 6 Air embolism (cerebral), 7 Right hemiplegia

Necropsy Report

External Examination The body is that of a moderately well nourished, 41 year old, black male, of large stature The skin is emphysematous throughout, with the exception of that of the left arm The scrotum and penis are tremendously emphysematous The superficial lymph nodes are not palpable

Internal Examination The right pleural cavity is partially obliterated by dense fibrous adhesions, the free part contains air and purulent material, the left pleural cavity is free of adhesions. It contains about 200 cc of a slightly purulent fluid and air. The pericardial sac contains a great deal of a slightly purulent fluid and the abdominal cavity contains 600 cc of a markedly purulent fluid.

Heart Weighs 210 gms. The pericardial surface is smooth. The myocardium is moderately firm. The ventricles are not dilated and contain no air. Ostia and valves are not changed. The myocardium is of normal color and is free of scars. The coronary arteries are not altered.

Aorta Apparently not changed.

Lungs Left weighs 920 gms, right 610 gms. The right lung is partly destroyed by cavities which are found throughout all lobes. The remaining tissue of the right lung is indurated and shows many patches of mottled grayish white tubercles throughout both lobes. The left lung contains air in most places, and many small patches of gray tubercles throughout both lobes. The bronchial lymph nodes are enlarged and caseous. The bronchi contain some purulent material. The pulmonary vessels are not altered.

Spleen Weighs 250 gms. The surface is covered with strands of fibrin. The consistency is rather firm and the mahogany brown cut surface shows several whitish-yellow nodules.

Kidneys Weigh 210 gms, each. The capsules strip easily leaving cortical surfaces which show a few yellowish gray nodules. The cortex is much enlarged, yellowish in color and well demarcated from medulla. The pelvis and ureters are essentially normal.

Urinary Bladder Contains very little urine. The mucosa is not altered.

Genitalia The right testis shows several scarred areas.

G I Tract This is in an advanced state of autolysis. On the lesser curvature of the stomach there is a round ulcer, the largest diameter of which measures 0.6 cm. There are several irregular ulcers with yellowish nodules in their base in the ileum.

Large veins Contain little blood.

Liver Weighs 1280 gms. The capsular surface and cut surface show a number of small yellowish gray discrete nodules. Otherwise, the liver is in an advanced state of autolysis. The gall bladder contains a small amount of brown bile. The bile ducts are patent.

Pancreas This is in an advanced state of autolysis.

Adrenals These are of usual size. The lipid in the cortices is rather well preserved.

Brain Weighs 1160 gms. It shows encephalomalacia in the distribution of the left anterior recurrent artery of Huebner. There are anomalies of the circle of Willis.

Pathological Diagnosis

1 Marked subcutaneous emphysema over entire body with exception of left arm, pyopneumothorax bilateral, purulent pericarditis and peritonitis, extensive fibrous pleural adhesions.

2 *Heart* Moderate atrophy.

3 *Aorta* Apparently normal.

4 *Lungs* Chronic pulmonary tuberculosis with widespread cavitation in right lung and widespread, chiefly bronchogenic, extension in both lungs, caseous tuberculosis of bronchial lymph nodes.

5 *Spleen* Tuberculosis, amyloidosis.

6 *Kidneys* Amyloidosis, lipoid nephrosis, tuberculosis.

7 *Bladder* Apparently normal.

8 *Genitalia* Scars in right testis.

9 *G I Tract* Autolysis, small peptic ulcer of stomach, multiple tuberculous ulcers in ileum.

10 *Liver* Autolysis, tuberculosis.

11 *Pancreas* Autolysis.

12 *Adrenals* Apparently normal.

13 *Brain* Encephalomalacia—distribution of left anterior recurrent artery of Huebner. Anomalies of circle of Willis.

Summary

An unusual case of spontaneous pneumothorax, subcutaneous emphysema, and cerebral air embolism is presented. These conditions were not due to any mechanical interference or induced by artificial pneumothorax therapy.

1922 Spruce Street

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Tuberculosis Among Nurses

PAUL VINCENT DAVIS, M.D.
Warrenton, Virginia

Robert Koch was probably one of the first to interest the profession in this problem of tuberculosis among nurses. Upon his suggestion, a survey was made in Germany of the hospitals, clinics, and sanatoria from 1906-1910. It was learned that, "in the general hospital infections of physicians and nurses were about four times as frequent in the special tuberculosis wards as in the dispensary departments"¹

The problem was more forcibly brought to the attention of the profession by Heimbeck in Oslo, Norway, when in 1927 he published figures showing that only about one-half of the nurses entering training in the Oslo General Hospital were tuberculin-positive, and further, that the negative reactors contracted the active disease with far greater frequency than did the initially positive reactors²

In 1928 Shipman and Davis at the University of California Training School for nurses reported on a three year study, after observing a sharp increase in the incidence of the disease during the preceding years. A laudable health program was instituted for the nurses with frequent physical and roentgenological examinations. There was a corresponding sharp decrease in the incidence of the disease³

There was a very able and practical discussion of the problem by J A Myers in 1930, when changing opinions were expressed and new concepts in the light of recent works

were pronounced⁴. He cited Braeuning's study in Germany on eighteen nurses whose past health had been perfect, but who had pulmonary tuberculosis at the time of the study. Fifteen had nursed tuberculous patients. Myers very aptly said "The greatest of all causes for the high incidence of tuberculosis among nurses is the exposure they suffer to the disease while in hospital or school residence"

That the disease exists among nurses to a far greater extent than one would anticipate, was made clear in a report by the Relief Fund Committee of the American Nurses Association in 1930. This report, covering twenty years (from 1911 to 1930) showed that of the 543 nurses receiving aid from the Association for illnesses, 48 per cent or nearly one-half had tuberculosis⁵

Investigating the incidence of tuberculosis among nurses at the Ancker Hospital in St Paul, Geer⁶, in 1932, observed that the previous nine year period showed three times the normal expected incidence among young women of the same age group. Intracutaneous testing was begun, with positive reactors having roentgenograms of the chest taken. It was found that about 30 per cent of the nurses were positive reactors on entering training while nearly 100 per cent were positive on graduation. A rigid program of aseptic nursing technique was instituted. From September 1930 to September 1934 the incidence of the disease dropped sharply. The three

nurses who contracted the disease in that period were all initially negative reactors to old-tuberculin

A five year study was instituted at Bellevue Hospital in New York City in February 1931. The program was very comprehensive, intelligent, and encouraging.⁷ During this period, it was found that of the 539 candidates for admission to the school of nursing, 58 per cent were positive reactors to old tuberculin. The majority became positive during their period of training. Eight cases of tuberculosis were detected by routine roentgenological examination, six with pulmonary lesions, none being aware of any symptoms suggestive of tuberculosis. In none of the cases was the diagnosis suggested by the findings six months previously. Of the eight cases, six were initially negative reactors. Because of early diagnosis, treatment was conservative and prognosis good in all cases.

At the Boston City Hospital a similar study was instituted in 1932 by Badger and Spink.⁸ Their findings were quite similar to the Bellevue study. During the five year period, of the 470 nurses admitted to training, there were 58 per cent initially positive reactors. Nearly all the nurses were positive reactors at graduation. Eight cases of tuberculosis were detected, seven of which were initially negative reactors.

Again in 1938, J. A. Myers⁹ (and co-workers) reported findings on tuberculin testing in three schools of nursing, with the school of Education at the University of Minnesota used as a control. All four groups showed essentially the same percentage (24 per cent) of initially positive reactors to old tuberculin. After a four year course the controls showed only 28.5 per cent positive reactors, while two of the schools for nursing showed 35 per cent and 43.5 per cent respectively. These figures are in marked contrast to the third school of nursing which had three months tuberculosis service in which the nurses were 94 per cent positive reactors upon graduation over a nine year period.

Soper, in New Haven¹⁰, who for some years has been interested in tuberculosis among nurses and medical students, reports that in the Yale School of Nursing from 1930-1937 there were six cases of tuberculosis out of 385 having admission roentgenograms of the chest. Of 191 graduates over a five year per-

iod, x-rayed at graduation, there were two cases detected, both of a minimal nature. The nurses have a tuberculosis service and less than a month is spent in a sanatorium. The average age is 23.

Case Studies

Herewith are presented 25 cases of active pulmonary tuberculosis among student and graduate nurses from 21 general hospitals. The diagnosis in each case was established beyond doubt, and made either from sputum studies, roentgenographic evidence or both. An intimate study of personal habits and symptomatology was made, together with positive evidence of contact with a tuberculous individual. All the cases were patients in the same sanatorium¹¹ at the time of the study, and constituted over 5 per cent of the total census.

The train of symptoms was closely investigated in all cases and the approximate dates compared with their professional status, the following facts being elicited:

a Two nurses had frank symptoms, one positive evidence, of pulmonary tuberculosis one year prior to beginning of training.

b Eleven nurses began their symptoms during training. When admitted to the sanatorium, eight were far-advanced.

c Twelve nurses began their symptoms on the average of eight years after graduation.

d The average age for all the cases was 28 years.

Clinically the whole group was classified as follows:

a Eighteen were far-advanced (75%)

b Four were moderately advanced (17%)

c Three were diagnosed as Minimal Tuberculosis (8%)

Three of the far-advanced cases were complicated by another disease, one by a positive Wassermann, one by diabetes mellitus, and one by epilepsy. The syphilis could not be treated adequately due to the production of an extreme generalized weakness. The diabetes was controlled with insulin and dietetic management. The epilepsy was effectively controlled with daily doses of phenobarbital. Of the three patients, only the epileptic did well, the other two becoming progressively worse with their tuberculosis.

Therapeutically, fifteen of the eighteen cases of far-advanced disease received effec-

tive pneumothorax treatment, with three having to submit to intra-pleural pneumonolysis in order to achieve this end. By effective pneumothorax is meant the conversion of the sputum from positive to negative, and the roentgenographic obliteration of the parenchymal excavation.

Two cases, on whom artificial pneumothorax was attempted and where it failed due to intrapleural adhesions, were forced to undergo thoracoplasty, one a two-stage, the other a three-stage, in order to obtain an effective collapse and convert the sputum.

The last case with far-advanced disease suffered an air embolus during an attempt to induce artificial pneumothorax, the immediate effects of which were a flaccid paralysis of the lower extremities, with incontinence of feces and urine. After fifteen months of bed rest, her phthisis and lower motor neurone paralysis had improved remarkably, so that she was being elevated "in the classes."

Contact

All the nurses have a positive knowledge of contact with a known tuberculous individual during or subsequent to training, although none of the nurses were on a tuberculous service or were affiliated with a sanatorium. In no hospital were these contacts isolated, and in only two was contagious technique attempted, and here, the wearing of masks was "optional." In none of the hospitals was the tuberculin test done on probationers, and in only one instance was a routine chest roentgenogram employed on nurses beginning their training. There were four "family histories" of tuberculosis among this group.

In regard to contact, the cases of five of the group are taken as typical.

1 One graduate, with far-advanced disease, and a successful right pneumothorax, said that all through training there were "breakdowns" throughout the hospital twice each year, one each spring and fall, with ten in all during a five year period. A pathologist died of the disease, as did an office employee, while a negress employed in the diet kitchen "broke down." Three student nurses and three graduates contracted the disease, while an interne was forced to "go on the cure" with far-advanced disease. When a nurse was

found to have tuberculosis, the room-mate of the tuberculous individual was forced to have a roentgenogram of the chest, but for others, either in the school of nursing or in any other department, it was not suggested. At that hospital there still does not exist tuberculin testing or roentgen-examination of the chests of probationers, as a routine procedure.

2 Another graduate nurse, who was forced to undergo thoracoplasty, said in regard to contact. That there was a physician on the staff who was a former sanatorium patient, who had cough, sputum, and hemoptysis. At times, he would be forced to bed because of weakness, and it was found at these times that his sputum was positive for tubercle bacilli. Ultimately he was forced to have a thoracoplasty. Five nurses have "broken down" in the hospital, two of these in this series of cases.

3 Another graduate said that there were frequently six or seven tuberculous patients on the ward simultaneously awaiting entry into a sanatorium. There were no precautions required of the nurses.

4 One student nurse, 17 years of age, and 1½ years in training, nursed three cases of pulmonary tuberculosis with positive sputums in as many months without precautions of any kind. During the fourth month she, herself, contracted a heavy "chest cold," characterized by cough and sputum. Her strength and appetite diminished, and she was forced to bed. Her sputum was found to be positive for tubercle bacilli, and the roentgenogram showed a basal pneumonitis.

5 Another student nurse, with far-advanced disease said that during her 18 months training period, she roomed with another student who "broke down" with tuberculosis. She, and the remainder of the group, had no subsequent roentgenograms of the chest. Her own disease was only detected by hemoptysis with positive sputum.

Background and Training

All of the group save two were rural born and received their preliminary education in rural districts. All were native born Americans, and of the white race. The course of nursing in all cases lasted three years. In regard to the food during training, the group was about equally divided as to "good" and

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"fair" The hours worked were 12, including classwork The two-three "hours-off" was usually consumed in classwork In regard to sleep Only three patients could say that they averaged over eight hours per night during training Fifteen said that it was "nearly eight hours," and that they always had a room-mate Five had a room alone, while five others had three or more room-mates All were temperate in their habits Many felt that the 12 hour duty was too long, and that much of that time was consumed doing menial tasks, in contrast to actual nursing experience, and text-book study

Discussion

Before, we have cited¹² that the greatest single factor in the spread of this disease is contact This applies to nurses no less than it does to laymen, and even to a greater degree, being exposed as they are to known cases, and many others who have the active disease unrecognized That strict precautions with contagious technique, and isolation, should be employed by the general hospitals is imperative That instruction in the vicissitudes of this disease should come from an active phthisiologist is quite fitting That this program can be well balanced by tuberculin-testing all candidates for training, and in having roentgenological examinations of the chest of all probationers, and routinely every four months, goes without saying

It is a moot question whether or not a tuberculosis service or a sanatorium affiliation is desirable for training, when one observes the high incidence of acquired infections among student nurses It is well known that the older nurses in the fourth and fifth decades of life rarely "break down" even after a long exposure in a tuberculosis sanatorium The average tuberculous patient requires simply general nursing care under precautions Would it not be more profitable for the training school to affiliate, if they must, with a psychiatric institution, where the student would gain a very useful experience It seems to us that to put a nurse in her 'teens or early twenties, on a tuberculosis service, or in a sanatorium, particularly one who is tuberculin-negative, is courting disaster

Even with the diminution of the incidence of the disease, pulmonary tuberculosis is a

distinct occupational hazard among nurses, and more so each year, when it appears that the incidence of tuberculin-negative probationers is on the increase That this disease is now the greatest hazard in nursing is recognized by many, when one observes how diphtheria, typhoid, smallpox, lues, and other communicable diseases have been wiped out, and pneumonia, meningitis, and streptococcal infections are amenable to treatment The tubercle bacillus stands alone not only in the chronic recurring disability for which it is responsible, but in being resistant and non-responsive to all forms of therapy save surgical collapse and compression of the parenchymal lesion

For over two years at the Minneapolis General Hospital, all patients admitted have been tuberculin-tested with the positive reactors having roentgenograms of the chest This is indeed a progressive step in prevention of the disease for it is the unrecognized cases which are such a menace to the health of the nursing and medical personnel of the metropolitan general hospitals

The eight hour working day for the student nurse is becoming more universal, and at no loss in institutional efficiency It is more generally recognized that the health of the student nurse is the direct responsibility of the hospital employing her, and that recreation facilities are part of the advantages which she should have Their health program is being carried out in many instances by an officially appointed internist who has a bent toward preventive medicine, and who bears the responsibility for their health during training

In summary and in conclusion Tuberculosis among nurses, as in the general population, is a communicable, but preventable disease Schools of Nursing must recognize this by the institution of proper nursing technique and instruction befitting an infectious disease The health of the student can only be maintained by regular, periodic, and appropriate examinations designed to prevent the occurrence of such a hopeless disability as far-advanced pulmonary tuberculosis

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Organization News

STATE SOCIETIES

At a meeting called by Dr Robert K Campbell, Governor for Illinois of the American College of Chest Physicians, at the University Club, Peoria, at noon, May 21, 1940, the Illinois State Society of the American College of Chest Physicians was organized *

ARTICLE I

- 1 NAME The name of the State Society shall be The Illinois State Society of the American College of Chest Physicians
- 2 MEMBERS All members of the American College of Chest Physicians residing in Illinois automatically become members of The Illinois College of Chest Physicians No others admitted

ARTICLE II

- 1 CONSTITUTION AND BY-LAWS The Constitution and By-Laws of The American College of Chest Physicians applies to all members of The Illinois State Society of the American College of Chest Physicians
- The following applies only to The Illinois State Society of the American College of Chest Physicians*

ARTICLE III—OBJECTS

The objects of the State Organization shall be to bring the members together for the purpose of promoting increased good fellowship and a better understanding of scientific and economic conditions through scientific programs and a discussion of economics as related to the care of chest diseases

ARTICLE IV—OFFICERS AND MEETINGS

- 1 There shall be three meetings each year The annual meeting of this society shall be concurrent with the meeting of The Illinois State Medical Society This shall be a business meeting and the officers of the society,

consisting of President, Vice-President and Secretary shall be elected for the ensuing year

- 2 There shall be a meeting in Chicago and a meeting down-state during the year as arranged by the officers of the society

The present members of The American College of Chest Physicians residing in Illinois and forming this society shall be considered charter members of The Illinois State Society of the American College of Chest Physicians

There shall be no dues in this State Society For the election of officers, Dr Robert K Campbell was nominated by Dr Schlack, seconded by Dr Palmer, as President As Vice-President Dr Schlack was nominated by Dr Joannides, seconded by Dr Webb For Secretary Dr Palmer was nominated by Dr Schlack and seconded by Dr Klein These candidates were elected without opposition

It was moved by Dr Schlack and seconded by Dr Webb that the President endeavor to avoid conflicting dates in the future with the meetings of the National Tuberculosis Association, the American Trudeau Society, The American College of Chest Physicians and the American Medical Association

On informal discussion, it was agreed that the next meeting should be held in Chicago during the autumn or early winter, possibly in connection with the Chicago Tuberculosis Society

The New York and New Jersey Fellows of the College met at a joint dinner meeting, held at the Biltmore Hotel, New York City, June 10, 1940 and organized the New York State Society of the American College of Chest Physicians and the New Jersey State Society of the American College of Chest Physicians

The dinner meeting was addressed by Dr Frank Walton Burge, Philadelphia, Pennsylvania,

* Charter Number I has been granted by the Board of Regents of the American College of Chest Physicians

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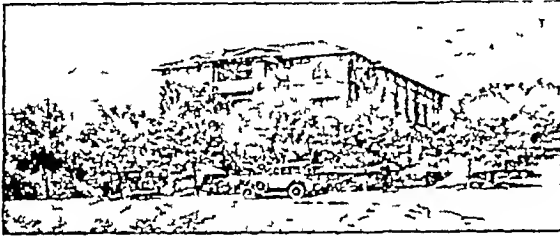
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Chairman of the Board of Regents, Dr Ralph C Matson, Portland, Oregon, Past-President of the College, and Dr John H Peck, Oakdale, Iowa, President of the College After the dinner meeting separate business meetings were held by the New York and New Jersey Fellows, respectively

Dr Edward P Eglee, New York City, Regent of the College for District 2, presided at the New York Meeting, Dr Lyman I Thayer, Glen Falls, New York, was Chairman of the Nominating Committee The following officers were elected

Dr Edgar Mayer,
New York City, President
Dr Nelson W Strohm,
Buffalo, Vice-President

Dr Arthur Q Penta,
Schenectady, Secretary

Dr B L Chipley, Paterson, New Jersey, presided at the New Jersey Meeting Dr M W Newcomb, Governor of the College for the State of New Jersey was unable to attend due to illness Dr James M Fine, Newark, was Chairman of the Nominating Committee

The following officers were elected

Dr Martin H Collier,
Grenloch, President
Dr Joseph C Morrow,
Ridgewood, Vice-President
Dr Chas I Silk,
Perth Amboy, Secretary

All of the above state societies will meet annually with their state medical societies

ELECTION RESULTS — 1940 MEETING

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**New York

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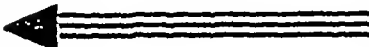
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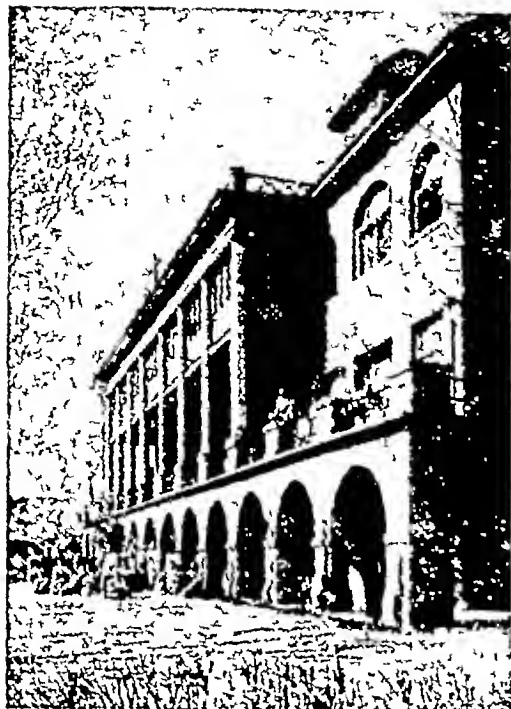
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Editorial Comment

The Leaven It is apparent that a force is at work throughout the United States which is quickening the minds of those interested in Tuberculosis Eradication. Thousands of physicians are, for the first time, grouping themselves together in county and state Medical Society Tuberculosis Committees, are seriously starting to study their local tuberculosis problems, as well as taking greater interest in those problems of nation wide importance in the Tuberculosis Crusade and they are asking questions, sensible questions. They want to know if their municipal, county and state tuberculosis institutions are up to the minimum standards as outlined under the Pennsylvania Plan for Tuberculosis. They want to know if their public health officers are doing their utmost to survey the apparently healthy adult groups which are known to be most heavily infected, in order to find the infected case early, while curable and inexpensively curable. They want to know if the money collected in the name of tuberculosis eradication is spent for tuberculosis eradication, or if it is frittered away on talking about it, or on some entirely unrelated subject.

Not only the doctors, but organizations in tuberculosis work are also enlivened. In many areas there is a cooperation of minds that

is leading to improvement and reform of actions and ideas in the Tuberculosis Eradication Work.

Let us each decide for ourselves whence comes this new force and then loyally try to keep it in operation. Life is active, though sometimes uncomfortable. Death is placid.

F W B

Talent Scouts In organizations which are alive, whether industrial, educational, or recreational, there is in action a systematic search for new persons of ability. When found, these "prizes" are joyfully added to the old group, be it a board of directors of a corporation, the faculty of a college, the talent of a moving picture company, or the members of a baseball team. Without "new blood" any organization becomes decadent, and dependent upon the excellence of judgment in selection of the new recruits is the future strength and vulnerability of the organization.

This is demonstrated in our tuberculosis organizations, from the smallest Tuberculosis Committee to the great Tuberculosis Societies. We cannot stand still in our personnel any more than we can in our concepts. There are many young and virile minds ready and willing to apply their best efforts in the Tu-

berculosis Crusade It is an opportunity we must not miss or they will find their way into other fields, to the impoverishment of our Cause

By the time this is published, it is hoped that the American College of Chest Physicians will have taken a step in this direction by having created an opening in the College for Associate Membership of chest specialists who are on the road to qualification for Fellowship

Our Fellows should try to see to it that in their localities men of force, who are interested in Tuberculosis Eradication, are given opportunity to become incorporated with some important active Anti-tuberculosis Work Cowardly leadership too often leads to selection of weaklings for positions of importance just because they are considered "safe" This safety is not for the cause, but for the weak leader It eventually wrecks the organization and the leader with it

F W B

World War II and Tuberculosis Immediately following the declaration of war, there was a severe disorganization of all peace-time health services in England Just how severe this disorganization became was realized early All tuberculosis sanatoria were included in the air raid casualty scheme Therefore, many infectious cases of tuberculosis were discharged from the institutions in order to provide casualty beds

There was a virtual cessation of ordinary hospital and private consultant facilities Administration services for tuberculosis practically ceased, out-patient clinic attendance was cut short, supervision and contact examinations became impossible, this all due to the fear of air raids which were expected to start with the out-break of war However, several months passed, and the immediate need for casualty beds ceased for the time Then the public health services began to take stock Immediate steps were taken to correct the situation They re-opened the tuberculosis clinics A search was begun for all discharged patients in order to return them to the various sanatoria The Minister of Health now has come to realize the great necessity of retaining a tuberculosis service unimpaired and uninterrupted, as a functioning machine for the civil population as well as for mem-

bers of the armed forces

There is still more concern in the minds of the authorities in regard to the armed forces *The British Medical Journal* points out "The recognition of incipient, or even ancient pthysical lesions in recruits still seems to be regarded by Medical Boards as a matter upon which radiography is relegated to an unimportant place, and physical signs decide the verdict A much wider use of radiography will have to be made if a large-scale admission of pthysical subjects to active service are to be avoided, with all the destructive influences that this would entail Mass photography of the screen image, which has already been tried abroad with promising results, may provide a cheap and rapid solution This is now being actively considered in this country, and we may hope that shortly it will become available, and its value determined"

These bitter experiences of the English should prove a valuable lesson to us

C M H

U. S. Medical Reserve Corps Every American Physician who is in good standing and physically fit has the opportunity of becoming a member of the Medical Reserve Corps of the United States Army and Navy Many members of our profession have long been members of the Medical Reserve

One has only to read of the disjointed situation in France, so far as the Medical Profession of that country is concerned, to realize how fortunate we American physicians will be if, and when, a National emergency occurs The majority of the officers of the Reserve Corps are assigned to certain units For this reason, there will be no element of surprise, or disruption of our plans when ordered to duty

In France, following an M-Day Plan made in 1920 (The French medical profession knew little or nothing of the plan until the out-break of War) the government skimmed off the cream of the profession for its use These physicians were given only 12 hours to say goodbye to their patients and families, and to wind up their professional affairs before reporting to their designated locations and units The transition caught some so unprepared that they had to ask for special leave

in order to clear up last-minute details. A vast majority did not have time to finish their daily visits, and in many cases before they got into their uniforms, their colleagues had been slipped in as replacements for their respective practices.

This cannot, and will not happen here if an emergency should arise causing medical reserve officers to be ordered to duty.

If there was a disruption of tuberculosis and other services in England, how much greater this disorganization in France must have been. Is it any wonder that the members of the Medical Profession in England and France have said "No matter who wins the war, the doctors will lose?"

In view of the foregoing, the members of our profession here in America should be grateful for the opportunity to join the Medical Reserve.

C M H

A New Opportunity for Case Finding

The vast expansion of the Army, Navy and Marine Corps

will afford a new opportunity for a tuberculosis survey of many of our youths. If we are to train 90 to 100,000 young aviators, it is more than likely that many of the applicants will be refused because of some physical defect, and not a few on the count of pulmonary tuberculosis.

In the conduct of these surveys, will we again depend upon physical examination alone in the case of tuberculosis, as we did in 1917? Will we again wait until there is a proved positive sputum before a definite diagnosis is made, or will we use mass x-ray and be sure at once?

With the stepping up of industry, in order to acquire the equipment for a larger military establishment, will we make a health survey of all the old and new workers in order to insure maximum working hours and reduce absences from illness?

There will be a greatly increased demand for women workers in the various departments of government as well as in industry, thus furthering the opportunity for expanding a case finding survey.

In the haste to expand, will we forget the human element, or will we as members of the medical profession, insist at the start on the maintenance of a functioning health sur-

vey of every individual incorporated, and eventually to be incorporated, in this vast movement toward adequate preparedness.

There are many of us, even though in high places, who do not believe the whole truth and are content with wishful thinking. Then there are the vast majority who are lethargic and unthinking. These two classes could well be grouped and labeled "The seventh column." This "seventh column" is by far the most dangerous of all to the security of our country. It is to be hoped that the leaders of our profession will at once take steps to impress those in authority with the importance of a thorough and sane case finding campaign in industry as well as in all branches of the military service.

The whole defense program depends on the 100 per cent functioning of every individual who has a direct part in it, therefore, a complete health survey, or if you please, a case-finding campaign, is necessary. We should adopt Caesar's old slogan, "The health of the people shall be supreme."

C M H

Last Call, 1940 Meeting

This is the last call, the last chance we will have to extend to you our most cordial invitation to attend the Sixth Annual Meeting of the American College of Chest Physicians, which will be held in New York City from June eighth to June tenth, at the Biltmore Hotel.

Over one hundred and fifty reservations have already been made—more than a twenty-five per cent increase over the registrations at this time last year. But one hundred and fifty is not enough. The number should at least be doubled!

The program which has been arranged warrants, indeed it demands, the attendance of every Fellow of the College who can possibly come to New York, and of every other physician who is interested in chest diseases.

If you are not one of the hundred and fifty, who have already made reservations, we urge you to pack a suitcase, send your reservation direct to the Biltmore Hotel, and attend an enjoyable and instructive meeting. Here's hoping you'll give us a chance to say "Hello" in New York, at the Biltmore.

F W B

Tuberculosis Case Findings through Mass Surveys in Adult Groups*

ABRAHAM E JAFFIN, M.D., F.A.C.P.**

Jersey City, New Jersey

The aim and purpose of all agencies engaged in the fight against tuberculosis is to eliminate the disease totally or at least make it as scarce as smallpox in modern civilized countries. We have already witnessed during the past three years a practical demonstration of an economic method of case-finding in the adolescent groups in our high schools. Here, at an average cost of forty-seven cents per student, thousands of young men and women have been examined. Scores of cases of tuberculosis have been eliminated from their midst—some advanced, most in the early stages.

This action has served many purposes.

First, it has enabled those discovered with early forms of the disease, to be restored to health in the shortest possible time.

Second, it has prevented further spread of the disease from the more advanced cases to their classmates.

Third, it has developed a tuberculosis consciousness in a considerable number of people, with all the benefits that may follow.

Fourth, it has led to the discovery of other cases in the homes of these students.

It would be ideal if arrangements could be made for an x-ray of everybody's chest. There would be, however, many practical difficulties in such a program. On the other hand, we cannot hope for any progress if we are to wait for public education to persuade those who feel well, to request examination. It is well known that from two-thirds to nine-tenths of early cases have no symptoms. These must be reached by modern case-finding methods which depend mostly on the x-ray.

There are many readily available groups of adults for whom arrangements for mass x-raying could be made. We cannot wait for symptoms or signs in these people if we hope to reduce the number of cases of tuberculosis

in the community, and the deaths from the same. All industries, wholesale and retail business houses with their numerous employees, WPA workers, recipients of public relief, food-handlers, transportation employees, as well as the inmates of custodial institutions, and police and fire departments, would yield many unknown cases of tuberculosis if surveyed. As a very good example may be cited the results of a recent health week at the YMCA in Jersey City where among 46 men who volunteered for x-ray, two cases of early tuberculosis were found.

The reports of the medical heads of various large industrial companies reveal that surveys of thousands of employees have led to the discovery of a similar percentage of cases. The actual figures vary from 23 per cent to 52 per cent, the number increasing with age.

The subject is of considerable importance in industry in view of the fact that tuberculosis is more prevalent than occupational diseases. We all know to what great length large corporations have gone to install measures to prevent occupational diseases. It is obviously just as important, if not more so, that steps be taken for mutual benefit for the earlier discovery of tuberculosis in its most curable form.

Quoting Dr. Selby¹ of the General Motors Corporation, "Industry can act as a case-finding agency, it can protect workmen against contact with open cases within the plants, and it can safeguard workmen against conditions of employment that might accelerate minimal lesions or aggravate quiescent ones, but it cannot control outside causes even though the employee group is affected. So the over-all problem of tuberculosis control in industry is one of general community concern. It cannot be segregated within industry. "So far as industry itself is concerned, the

* *Health Forum Talk*, given under the auspices of the Hudson County Medical Society, Hudson County Board of Health over the radio on June 23, 1939, Station W A A T.

**Chief of Clinics, Hudson County Tuberculosis Clinics, Chairman, Advisory Committee on Tuberculosis of The Medical Society of New Jersey.

¹ Selby, C. D. "The Control of Tuberculosis in Industry—A Responsibility and a Profit," *Transactions of 34th Meeting of N. T. A., Los Angeles, California, 1938*, Reprinted in *Diseases of the Chest*, Vol. VI, No. 5, May, 1940.

sound long-range program is to clear the plants of tuberculosis and to keep them clear. This does not necessarily imply that all workmen who have tuberculosis are unemployable. It does mean, however, that they must be employed only under conditions that permit them to work in safety to themselves and their fellow-employees and they must have close medical supervision."

Our various large industries, therefore, also offer a most fruitful field for the early discovery of tuberculosis in its more easily curable stages. The advantages of early discovery are shared mutually by the employers as well as the employees. We can stop the spread of disease in the plant, and its effect in lowering the plant's efficiency. The benefits to the worker's home as well as to the community at large are obvious.

The experiences of the Metropolitan Life Insurance Company and many hospitals have proved the value of frequent periodic fluoroscopic or x-ray examinations. Boards of Health can readily enforce an x-ray of the chest as a requirement for a food-handler's permit. Large transportation companies can very easily be persuaded to arrange for x-raying motor-men, chauffeurs, conductors, porters, etc., through their own medical relief organization, unions or through other channels. Our city and county governments should automatically have every inmate under custodial care, and in hospitals, subjected to an x-ray of the chest. The probabilities are that a very high percentage will be found among the inmates of mental disease hospitals and jails. There should be no difficulty in having members of the police and fire departments x-rayed periodically. Finally, in view of the large number of unemployed, those applying for WPA jobs or public relief should be required to have an x-ray of the chest and, naturally, this should be provided for out of funds set aside for their maintenance. All this can be done sensibly without any undue tax burden. In many groups, the individuals can themselves pay the nominal cost of a paper film, while for those who cannot afford even this charge, it would be good business on the part of many municipalities to provide

it without cost, as a means of early diagnosis. It would save the community many months or years of costly treatment. The medical profession with few exceptions stands ready to support such a program. *Objections to such plans usually emanate from those least familiar with their aims and possibilities.*

Editorially, the *New York Post* on June 16th, 1939 stated, "Perhaps in the World of Tomorrow, men and women no longer will die needlessly of tuberculosis because their doctor never knew they had the disease until it was too late. Every authority on tuberculosis agrees that early diagnosis and treatment greatly improve chances of cure. This is the doctrine which the New York Tuberculosis and Health Association has been preaching for years. The Medical Society of the County of Queens is doing something to make quick recognition of tuberculosis easier. Anyone who visits the Medical and Public Health Building at the World's Fair can have a chest x-ray for one dollar. The picture of the lungs and heart is taken on a new paper film which brings down cost. The films are interpreted by a committee of physicians expert in the work, whose members were selected by the society, and the report sent to the subject's own physician."

"Since the x-ray exhibit opened, more than 2000 persons have been examined. In about 12 per cent of the first 500 films read there were found shadows on the lung which indicated the person examined would benefit from observation by a physician or, in some cases ought to be treated. As many as 1,000 persons a day could be x-rayed by use of a portable machine such as is being demonstrated, according to the manufacturers, at a school, office or factory."

"We think the county medical societies might well cooperate with fraternal organizations, unions, employers and educational authorities in a continuing effort to provide an annual examination of every man, woman and child in the city. The doctors would have *more patients and fewer hopeless cases*, the people would have *more health and less lingering illness*."

Studies in Asbestosis

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The diagnosis of asbestosis, its clinical course, the effect it produces on organs other than the lungs, as well as its various complications and sequelae, are very much in the controversial stage. Only within the last decade has the subject of asbestosis really received the attention of the medical world. The literature on this subject is still rather vague and only recently has the hazardous nature of exposure to asbestos dust been recognized and studied. To be sure, asbestos is not a new mineral¹. The mineral mentioned in the writings of Herodotus and the second Pliny, was known to the Romans who mined it from the Alps and the Urals. In 1900, Montague Murray recorded in the *Charing Cross Hospital Gazette*, a case of disease due to inhalation of asbestos dust.

Hoffman was the first American to focus attention on the magnitude of the asbestosis problem in the United States. In the same year, Lynch and Smith reported their findings on asbestosis bodies found in the alveoli and bronchioles and in the fibrous and necrotic areas. Gloyne and others have described the asbestosis body as a core of asbestosis fiber surrounded by iron containing deposits. The bodies are slender, elongated, segmented structures with bulbous ends and stain blue when treated with potassium ferrocyanide. The essential features of the pathological changes of asbestosis appear to be pleuritis, marked diffuse fibrosis with contraction of the lungs, and the presence of the asbestos fibers and the asbestosis bodies. Thickening of the visceral pleura with varying degrees of pleural and pericardial adhesions is often found. Obliterating layers of fibrous tissue may surround the bronchioles and pulmonary end arteries. Lynch and Gloyne note that the presence of asbestos fibers in the mouth and nose are an indication of exposure, but not necessarily of disease. Essentially the presence of asbestosis

bodies in the sputum indicates exposure to asbestos dust, but it does not absolutely denote disease.

This report is based on a study of 180 patients examined by the author in collaboration with the late Dr. John B. Hawes, II. The great majority of patients had been employed in a factory manufacturing asbestos brake linings with an average exposure time of five to fifteen years.

Classification

Of the 180 patients, 32 were diagnosed as negative, although these individuals claimed disability. X-ray films as well as physical signs failed to show any abnormalities that could be attributed to asbestosis. Seventy-eight patients were classed in Stage I, when there was definite limitation of chest expansion (less than 2 inches), in addition to roentgenological evidence of increased lung markings. Unlike silicosis, the very early fibrotic changes are very indefinite and only after considerable experience, together with careful standardized x-ray technique and proper history, can a diagnosis of early asbestosis be made. In Stage II, there were fifty-four patients who had definite symptoms and definite x-ray evidence of pulmonary fibrosis. Included in Stage III, were sixteen patients who had definite symptoms as well as roentgenological evidence of marked pulmonary involvement. The average length of exposure of the Stage I patient was eight years, Stage II, 10 years, Stage III, eleven years. While there is slight evidence that the degree of fibrosis is apt to increase with the length of exposure, there are other factors, such as intercurrent pulmonary infections, that play a part in the development of fibrotic changes in the lung structures.

Dyspnoea was the outstanding symptom in all patients. Dyspnoea on slight exertion, tightness of the chest, cough, general fatigue were among the other symptoms noted. In Stage III the patients also complained of inability to sustain any effort, cough, expectoration, tightness of the chest, anorexia and loss of weight.

¹ Asbestos is a hydrated magnesium silicate, the composition of which varies with the sections from which it is mined. Most of the asbestos used in the United States is Canadian crysotile containing approximately 43 per cent magnesium, 13 per cent water and traces of nickel and iron and aluminum.

Physical findings were quite meager and were not in proportion to the symptoms offered by patients. Many cases showed dullness at the bases with hyperresonance at the apices associated with diminution of chest expansion. Auscultation disclosed prolongation of the expiratory phase with some high pitched dry rales. Associated bronchitis or bronchiectasis may be present.

X-ray examination constitutes the most important single procedure in the diagnosis of asbestosis. The shadows are much finer, lighter and more granular than the nodular patchy type of infiltration found in silicosis. In the early stages a relatively slight increase in density in the lung bases is seen. With progression of the disease and thickening of the pleura, a fine lace-like fibrosis is found. The typical granular or "ground glass" appearance is then noted, especially in the mid-lung and basilar areas. The broncho-vascular markings are increased and pericardial and pleural thickenings are noted. Many cases show limitation of motion and elevation of the diaphragm. With associated disease the parenchymatous changes become more marked. In the series of cases studied, bronchiectasis, bronchitis and bronchopneumonia were found to be more frequently associated with asbestosis than was tuberculosis. In addition, tuberculosis did not impress the author as being a serious complication of asbestosis. Only one individual in the total series subsequently developed active pulmonary tuberculosis.

In 150 patients the cardiac aspects of asbestosis were studied. Ninety patients (60 per cent) showed prominent pulmonary vessels due either to enlargement or increased perivascular fibrosis. Asbestosis was associated with an increased transverse diameter in 33 per cent of the cases and 13 per cent had marked right-sided hypertrophy. The cardiac outline is obscured and blurred by the super-

imposed increased fibrous tissue. The thickening of the pleura, the marked emphysema and the pulmonary fibrosis may cause rotation or lateral displacement of the heart. Roentgenoscopic examination is essential to determine enlargement of the heart shadow and alterations in the cardiac silhouette. The x-ray appearance of asbestosis may be greatly altered by the congestion due to associated heart disease. It is also evident that the dyspnoea noted early in this disease is of cardiac or circulatory, rather than of pulmonary origin.

A small group of patients were reexamined three years following the first examination. X-ray, electrocardiographic blood studies and vital capacity examinations were done. The vital capacity was found to be 50-70 per cent below the normal, calculated on the basis of height and weight. The impression gained from the study was that in cases of advanced fibrosis the disease may progress even after exposure ceases. The heart was not affected unless pulmonary fibrosis was marked. In the light of the blood studies, fibrosis is the result of irritation due to asbestos fibers and not the result of infection. Since the first examination, 18 patients have died. Most of the patients still pursue gainful occupation, but are unable to perform duties that demand much physical exertion.

The impressions gained from the above study are that asbestosis is a debilitating disease caused by exposure to asbestos dust, tuberculosis is an infrequent complication and pulmonary infections, other than pulmonary tuberculosis, are fairly frequent complications. In advanced asbestosis, the right ventricle may dilate with subsequent pulmonary congestion. Like silicosis, asbestosis is caused by exposure to asbestos dust and should be classified as an industrial hazard. Hence such patients should be entitled to compensation under the industrial accident laws.

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Basal Lesions of Pulmonary Tuberculosis among Filipinos

J P TIRONA, M.D *

Manila, P I

The prevailing opinion among the majority of clinicians is that the upper lobes of the lungs are more vulnerable to pulmonary tuberculosis than the lower lobes. This fact may be attributed to two causes. The first is that many of the textbooks dealing with pulmonary tuberculosis give the impression that this disease originates in the apices of the lungs. The second is that experience has taught physicians that chronic upper lobe lesions of the lungs are generally considered tuberculous until proved otherwise. The contrary, however, is true in chronic basal lesions, for cases of lower lobe tuberculosis are extremely rare. Fishberg¹ states "A lesion at the base while the apex is free should be considered non-tuberculous unless the sputum is positive as regards tubercle bacilli."

In 1935 at the University of the Philippines Infirmary, Manila, two positive cases with basal lesions were seen within a month. This unusual opportunity prompted the writer to study these cases.

All suspicious basal lesions from a group of 14,337 tuberculous cases were studied. The majority of these cases came from Santol Tuberculosis Sanatorium (now Quezon Institute). The rest came from the University Health Service, Manila.

Incidence

According to Fishberg¹ and Laenec², basal tuberculosis is extremely rare. Pottenger³ failed to discuss this condition.

Hamilton and Fred⁴ found ten proved cases out of 349 patients, showing an incidence of over three per cent. Kidd⁵ found two cases out of 412 patients. Du Fault⁶ found one in 365 cases. Rosenblott⁷ found three cases in 1,000. Ross⁸ found eleven cases in 60 tuberculous nurses. Lathrop and Lyman⁹ found 80 cases among 2,809 tuberculous cases. Weidman and Campbell¹⁰ found 40 out of 1,401 tuberculous patients. Incidence, according to Kidd, varied from one in eighty cases to one in five hun-

dred cases, according to different writers.

The incidence of basal lesion in this report is one for every 1,300 tuberculous cases. Since most of these cases of basal lesions were seen in the year 1935, the incidence would have been higher had the computation been based on this year alone, thus giving a very erroneous picture of the true incidence.

Even using the figures of Kidd, which are the lowest published, that is one to five hundred cases, the incidence among Filipinos is still lower, when the prevalence of pulmonary tuberculosis is considered. In the Philippines tuberculosis occupies first place in the mortality statistics (over 30,000 deaths yearly).

Modes of Development

There are many theories concerning the development of basal lesions of pulmonary tuberculosis. H. K. Pancoast expressed the belief that this condition is due to some blood stream infection, an atypical manifestation of miliary tuberculosis, while other writers believe it to be a distinct type of tuberculosis similar to the childhood form. Still others think that this condition is but a retrograde lymphatic infection, or an extension from the hilum, either by contiguity to the tracheo-hilar lymph nodes or rupture of a caseated node into a bronchus. Colton¹¹ is one of the advocates of this theory. He said that the most plausible explanation would be a rupture of a hilar or tracheo-bronchial lymph node into a large bronchus or a lodgment of a massive infection in the terminal bronchioles and alveoli producing a broncho-pneumonia involvement.

In the x-ray examinations of the basal cases in this report, besides the antero-posterior positions, the patients were also examined in the semi-lateral positions. The object of this was to minimize, as much as possible, the possibility of superimposition of shadows on the hilus from infiltrations of the posterior surfaces of the lower portions of the lungs.

The majority of the previous x-ray records

* University of the Philippines Health Service Department

of these eleven positive basal cases showed enlarged hila, a very common finding in radiographs of the chest. So common are these findings that they are oftentimes not given any importance at all either by radiologists or clinicians. The presence of apparently calcified or enlarged lymph nodes in the hilus with active clinical symptoms are very suggestive of a tracheo-hilar type of tuberculosis. Since these basal cases were followed from two to five years with periodical x-rays, the mode of development from a tracheo-hilar type of tuberculosis to that of a basal lesion became apparent.

The basal parenchymal infiltration is best studied by means of serial radiographs and fluoroscopies. Fluoroscopy alone is not very satisfactory as oftentimes the fine nodose infiltration of the parenchyma is not detected. Radiography, besides eliminating the deficiency of fluoroscopy, keeps permanent records of the progress of the lesions.

From the cases studied in this report, the radiographic lesions of the basal parenchyma may be classified into fine nodose and fibrocaceous or pneumonic infiltrations. The fine nodose infiltration usually takes a slow course and has the usual manifestations of a chronic upper lobe tuberculosis. Probably this type of lesion is due to direct extension of infiltration from tuberculous tracheo-hilar lymph nodes, and this is the reason why the development is slow as compared with the fibrocaceous type. The fibrocaceous or so-called pneumonic infiltrations take a more rapid course and are generally accompanied by acute clinical symptoms, simulating pneumococcal pneumonias. Most likely, this is brought about by rupture of tracheo-hilar lymph nodes with lodgment of massive infection in the terminal bronchioles and alveoli and the development of a broncho-pneumonic process.

When hilar lymph nodes rupture into a blood vessel, miliary tuberculosis may take place. I have followed several of these cases. The last one that I saw was during the latter part of 1937. The patient was first confined in a general medical ward for observation. The chief complaint was low grade afternoon fever. Physical examination of the chest was apparently normal. Sputum was negative for acid-fast bacilli three times by direct method. Radiography of the chest showed marked peri-

bronchial thickening of the hilus with numerous enlarged lymph nodes, very suggestive of a tracheo-hilar type of tuberculosis. After two weeks the fever of the patient became high and more or less continuous. Liver and spleen became palpable. The blood cultures for typhoid bacilli and Widal tests being negative, the case was suspected of clinical typhoid fever. But a second radiography of the chest showed miliary tuberculosis.

The possibility of infiltration of the basal parenchyma secondary to a pleurisy is a factor to be considered. I have had several of these cases under observation for the last two years. Previous fluoroscopic records of these cases showed no evidence of tracheo-hilar tuberculosis. Subsequent radiographs showed that after the absorption of the pleurisy, as manifested by the disappearance of the homogenous opacity, the basal parenchymatous mottlings appeared. So far it is only case (XI) that became positive. Although the other cases have active pulmonary tuberculosis symptoms, the confirmatory tests (acid-fast bacilli in the sputum) are still negative. Since eighty per cent or more of these pleurisies are tuberculous in nature, the finding of acid-fast bacilli in the sputum is only a question of time.

Pneumococcal lobar pneumonias, especially those affecting the lower lobes, may be considered also as a predisposing factor for the development of basal lesions of pulmonary tuberculosis. Resistance being weakened following pneumonia, the lungs are predisposed to pulmonary tuberculosis. It is also possible that pneumonia may activate some calcified or apparently arrested tuberculous foci in the basal parenchyma. So far there are only two positive basal cases that apparently developed in this way. In the rest of the cases, although the radiographic and clinical findings are those of basal infiltration, the sputum examinations are still negative.

From the cases that I have observed, I am of the opinion that basal or lower lobe lesions of pulmonary tuberculosis should not be considered as a type (basal type) by themselves. Most of the infiltrations of the basal parenchyma are either due to an extension from a tracheo-hilar type of tuberculosis, or probably arise as complications of pleurisies and pneumonias.

The term primary basal lesion of pulmonary tuberculosis, when applied to adults, should be used with discretion. Tuberculosis in adults is usually caused by a reinfection, while the primary lesion is generally seen during childhood. Adults may have the primary basal lesion, but this is extremely rare, although as Boyd¹² says, primary lesion may occur in adults of primitive races who have not been exposed to previous infection.

Symptoms

The symptoms of lower lobe tuberculosis are extremely variable. Some cases may have the typical chronic upper lobe tuberculous symptoms, while others begin like acute pneumonic conditions. Still others, for a long time, may have no noticeable symptoms at all, the lesions being discovered accidentally only during routine physical and x-ray examinations of the chest. Pindell¹³ expressed the opinion that basal lesion may exist for years without noticeable symptoms, but the great majority eventually exhibit manifest disease.

In the cases of basal lesions reported here, the symptoms vary according to the degree of infection, type of infiltration and resistance of the patient. While the lesion is small and limited to the tracheo-hilar lymph nodes, there is practically no noticeable symptom, except at times general malaise, anorexia and frequent "colds," which last for weeks. When these patients are put under four-hour temperature observation, there is generally a slight noon or evening rise of 0.5 degree C. If periodical roentgenograms of the chest are taken together with the temperature observations, the suspicion of the disease becomes more apparent.

With the infiltration of the basal parenchyma, the toxic manifestations, especially the fever, becomes so pronounced that it can be noticed by the patients without the aid of thermometer. In fine nodose infiltration of the parenchyma, the symptoms are more or less the same as in upper lobe lesions of the same type of infiltrations. But in fibrocaseous or pneumonic infiltrations, the fever is generally high at first and more or less continuous in character. There is generally a slight leukocytosis, which fact has also been verified by other workers. The high continuous fever plus the moderate leukocytosis of the basal fibrocaseous infiltration can be easily mis-

taken for early cases of pneumococcal pneumonia. When the high fever persists for several weeks, these cases of tuberculous basal lesions are generally mistaken for unresolved pneumonias. Should only sputum examination for acid-fast bacilli and periodic radiographies be done routinely on these questionable and unresolved pneumonias, more cases of basal lesions might be detected.

Diagnosis

Careful history taking, frequent sputum examinations, periodic roentgenograms or fluoroscopies and long follow-up observation of cases are essential in order to make a correct diagnosis of lower lobe tuberculosis.

In taking the history, one must not be satisfied with the absence of a family history of tuberculosis alone. Oftentimes long contact with undiagnosed cases in boarding houses or dormitories may be a predisposing factor. History of slight blood streaks in the expectoration and frequent colds which persist for weeks may help in diagnosing these cases.

Sputum which is positive for acid-fast bacilli is the only confirmatory factor in establishing an unquestionable diagnosis of basal lesion of pulmonary tuberculosis. But sputum is oftentimes negative in early basal cases of tuberculosis, especially when casual direct examinations are performed. Gordon and Charr¹⁴ expressed the opinion that excavations in lower lobe cases are less "open" than in upper lobe cases, and obstruction in the bronchi may interfere with the free evacuation of the cavity contents. One must also remember that there must be at least 100,000 tubercle bacilli present per cubic centimeter to obtain a positive reading by ordinary methods.

Should repeated direct method of examination of sputum fail, one must resort to concentration method, animal inoculation and culture, if necessary. Pinner¹⁵ found fifty-six cases positive by other methods of examinations (concentration, animal inoculation and culture).

Physical examination alone has little value in the diagnosis of lower lobe lesion, since most of the early cases have very little or no physical findings at all.

Periodic radiographies together with long observation of the clinical course are essential to a correct diagnosis of lower lobe

tuberculosis in the absence of confirmatory findings Interpretation from a single radiograph alone is often-times misleading To quote Hamilton and Fredd, "Roentgenologists' interpretation often suggest unresolved pneumonias, abscess, tumor, syphilis, bronchiectasis, or chronic pneumonitis rather than tuberculosis solely because the lesion is located in the lower lobe, it can readily be seen how easy it is to rule out tuberculosis if one is so inclined As a result, chronic lower lobe lesions are perhaps too often attributed to other causes, i e, cocci¹⁷ Yet Lathrop and Lyman found 67 per cent of lower lobe lesions were due to tuberculosis and only 33 per cent were due to other causes "

Differential Diagnosis

Differential diagnosis of lower lobe tuberculosis is being omitted in this paper for lack of space It must be remembered that cases of lower lobe tuberculosis may take months or even years before the confirmatory test becomes positive Even a few negative sputum examinations by concentration method, culture or animal inoculation can not entirely rule out lower lobe tuberculosis

According to Wooley¹⁸ 5,000 tubercle bacilli per cubic centimeter must be present in the sputum, if they are to be found by concentration methods Weldman and Campbell reported one case out of their series with negative sputum, which at necropsy revealed pulmonary tuberculosis Confirmatory laboratory examinations are good, but one must bear in mind that too much time may be lost while waiting for positive results and thus deprive the patients of the benefits of early treatment

Prognosis

There is a diversity of opinion as to the prognosis of lower lobe tuberculosis, according to the findings of different workers Pindell in 1932 expressed his opinion on basal lesion as treacherous, while Colton considered this condition to be grave Dumhan and Norton found from their experience (26 cases) that basal lesions are virulent Hamilton and Fredd, basing their experience on ten cases could not agree with these statements

From this report, I would hesitate to give any definite opinion in regard to prognosis because the cases observed were very few Besides, there are certain factors that must

be taken into consideration which may influence the prognosis First, the dose or degree of infection Virulence of the bacilli may also be added, but according to Boyd this does not appear to play an important part Second, the type of infiltration of the basal parenchyma In fine nodose infiltration, the tendency of the development is generally chronic whereas in fibrocaseous or pneumonic infiltration, it is generally acute As the majority of the basal lesions are of the fibrocaseous type, this fact is probably responsible for the grave prognosis given by other workers Third, resistance or immunity of the patient When the resistance of the patient is good the tendency to repair is generally greater than the destruction process, especially if the affected lung can be put at rest (Boyd) Fourth, early diagnosis is essential so that the proper therapy can be given At times, in spite of early diagnosis and treatment, the base of the contralateral lung becomes involved, as in Case IX

Due to these different factors, the prognosis of basal cases in general is reserved Only after a case has been sufficiently observed can one give more or less of a definite opinion as to the prognosis of that case

Treatment

With reference to the therapy of basal lesion, there is not much that can be said The treatment is the same as in upper lobe tuberculosis Exudative basal lesions of the fibrocaseous type of infiltration should be treated by early collapse therapy so as to prevent adhesions which may develop later on

Cases of suspicious basal lesions with occasional negative sputum examinations should be treated as tuberculosis, because by so doing, the patients are given the benefits of early treatment

Report of Cases

Case I

S J, female, Filipino, college student, seventeen years old had been complaining of constant chest pain and afternoon fever since June 27, 1934 There was no history of pulmonary tuberculosis in the family Physical and sputum examinations were negative Fluoroscopy showed peribronchial thickening

of the left hilus with enlarged lymph nodes. On October 29, 1934, the patient was admitted at the University Infirmary with the complaints of cough of two weeks' duration and loss of weight. Physical and laboratory examinations were again all negative, but there was a regular rise of afternoon temperature. Radiography was done on October 30, 1934. Peribronchial thickening of left hilus with numerous enlarged lymph nodes were seen. Between the sixth and seventh ribs posteriorly on the left side was a small area of about one centimeter in diameter of nodose parenchymatous infiltration with fading out margins. The rest of the parenchyma was apparently clear.

The patient was readmitted at the U P Infirmary on July 17, 1935 with the same complaints of fever, cough and loss of weight. Physical and sputum examinations were again negative. On July 26, 1935, nine days later, there was dullness evident over the left base with slightly distant breathing, but no rales. Radiography was again done on August 5, 1935. Compared with the radiograph of October 30, 1934, the nodose infiltration between the sixth and seventh ribs posteriorly was intercepted with linear fibrosis. From the eighth rib posteriorly downwards, there was a generalized homogeneous opacity with patches of dense areas, the tendency of which was to invade the entire basal parenchyma. The infiltration was very suspicious of tuberculosis, but due to the rarity of basal lesion and negative sputum examinations, further observations were made.

On August 10, 1935, the patient was very sick. Fever was more or less continuous, ranging from 38° C to 40° C. Leukocyte counts varied from 11,900 to 12,950 with polys from 58 per cent to 72 per cent. The sputum tested by direct method for acid-fast bacilli was three plus. Radiography was done a third time on August 18, 1935, showing a fibro-caseous infiltration of the lower half of the left lung.

The patient was transferred to Santol Tuberculosis Sanatorium (now Quezon Institute) on August 18, 1935 for confinement and treatment. She was under collapse therapy for more than a year and her sputum became negative for the first time on October 13, 1936. She was discharged on November 21, 1936, afebrile and with a great gain in weight.

During the early part of 1937, the patient developed pleural effusion while she was continuing her pneumothorax treatment in Vigan, Ilocos Sur, P I.

Case II

G M, nineteen years old, Filipino, college student, was first seen on August 1, 1935 complaining of loss of appetite, afternoon fever, chest and back pains and bloody streaks in the sputum. Previous illnesses were Right basal lobar pneumonia in May, 1935. Cervical lymphadenitis (tuberculous) in 1930. The present illness began on August 1, 1935, with fever, cough and bloody expectoration. Physical examination showed dullness over right base with broncho-vesicular breathing and fine moist rales, and the laboratory examination, Leukocytes—13,800, N—72 per cent, S L—15 per cent, L L—10 per cent, M—3 per cent. Sputum tests for acid-fast bacilli were negative five times and became positive on August 7, 1935. Radiography was done on August 7, 1935 and showed a beginning fibro-caseous infiltration of the right base. Follow-up fluoroscopic examinations showed that there was a tendency for the infiltration to spread to the entire right base, so collapse therapy was instituted with apparently good result.

Comment. The fluoroscopic record of this patient, before he developed the right basal pneumonia, showed both lungs were apparently clear. This fact, however, does not rule out entirely the presence of some minute calcified or apparently arrested tuberculous foci in the right basal parenchyma which was later activated by the pneumonia. It is also possible that due to a weakened resistance following the pneumonia, the lungs, especially the right base, became easily vulnerable to tubercle bacilli, the most probable focus of infection being the tuberculous cervical lymph adenitis.

Case III

S B, male, single, nineteen years old, college student, was first seen on June 2, 1937 with the complaints of chest and back pains. There was no family history of pulmonary tuberculosis. Auscultation showed a few moist rales at the right interscapular region. There was low grade afternoon fever with a pulse of above 90 per minute. Sputum was nega-

tive Radiography, June 2, 1937, showed pulmonary tuberculosis, right tracheo-hilar type, with a tendency of the infiltration to extend to the base. The patient had hemoptysis on September 9, and September 15, 1937. Radiography on September 9, 1937, as compared with that of June 2, 1937, showed that the basal infiltration was more extensive and that practically the entire base was involved. The sputum then became positive. Collapse therapy was instituted and after six months' treatment the sputum became negative. At present, this student is free from active symptoms of pulmonary tuberculosis and he has gained twenty-three pounds in weight. He is now able to continue his studies in college, although he is still under pneumothorax treatment.

Case IV

A S, male, single, twenty-four years of age, college student, was first seen during the first week of October, 1937, with the chief complaints of afternoon fever and cough, which had been present intermittently for the past month. There was a history of lobar pneumonia, right base, on August 19, 1937. His mother had died of pulmonary tuberculosis in 1934. Physical examination showed dullness, broncho-vesicular breathing and fine moist rales over the right base. Radiography, October 22, 1937, showed fibrocascous infiltration of the right base. Sputum was negative several times by direct method, but positive by concentration method. Patient refused collapse therapy.

Case V

J Q, male, single, twenty-one years old, college student, was admitted at the U P Infirmary on October 29, 1937 with the chief complaints of fever, cough, chest and back pains. Physical examination showed dullness, distant breathing and moist rales over the left base. The temperature was generally normal in the morning, with a tendency to rise in the afternoon as high as 39.5°C . The laboratory findings were: Leukocytes—12,200, N—71 per cent, S L—17 per cent, L L—10 per cent and L M—2 per cent. Daily sputum examination was negative for one week. A couple of drops of saturated solution of KI was given for two or three days. The sputum was again examined and it became positive.

Radiography, November 2, 1937, showed fibrocascous infiltration of the left base.

Case VI

E C, forty years old, female, married, Filipino, instructor in voice culture, was admitted to the Philippine General Hospital, Manila, on July 3, 1937 with the chief complaints of fever, cough and difficulty in respiration. Physical examination revealed slight dullness, distant breathing and fine moist rales over the right base. The temperature was 39.5°C , pulse, 116. Radiography was done on July 8, 1937, showing peribronchial thickening of right hilus with numerous enlarged lymph nodes, and fine nodose, parenchymatous infiltration of the right base. The left lung was apparently clear. Sputum by direct examination was negative six times, but positive by concentration method. Right artificial pneumothorax was immediately instituted. At present, the patient is able to continue her work after two years of treatment.

Case VII

R C, fifteen years old, male, single, Filipino student, complained of back pains, fatigue on slight exertion, afternoon fever and cough. His mother and sister are suffering from active pulmonary tuberculosis. Physical examination showed dullness and broncho-vesicular breathing over the right base but no rales. Temperature was 37.4°C at 3 00 P M, pulse, 100. Sputum was negative seven times by direct method and positive by concentration method on September 28, 1935. The patient has been under observation for the last three years. Radiography was done on September 15, 1935. Tracheo-hilar type of tuberculosis with a tendency for the infiltration to invade the right basal parenchyma was present. Subsequent follow-up fluoroscopic examinations showed involvement of the entire right base. Patient refused pneumothorax treatment.

Case VIII

D P, male, single, eighteen years old, Filipino, was first seen on July 7, 1935 with the chief complaints of afternoon fever, cough, chest and back pains. Physical examination showed slight dullness, broncho-vesicular breathing and fine moist rales over the right base. Sputum was negative several times by

direct examination, but positive by concentration method Radiography, August 14, 1935 showed marked peribronchial thickening of right hilus with numerous enlarged lymph nodes, fibrocaceous infiltration of the right base, and slight peribronchial thickening of left hilus with beginning infiltration of left base

Case IX

V P, forty years old, carpenter, male, Filipino, was admitted at the Bilibid Prison Hospital, Manila, on January 28, 1935 with the chief complaints of fever, cough and bloody expectoration His parents had died of pulmonary tuberculosis while the patient was still young Physical examination revealed a well developed and well nourished individual Chest examination showed dullness, broncho-vesicular breathing and fine moist rales over the right base Sputum, by direct method was positive on August 26, 1935 Radiography was done on July 5, 1935 and marked peribronchial thickening of right hilus with numerous enlarged lymph-nodes was evident, as was fibrocaceous infiltration at the base of the right hilus with a tendency to invade the entire basal parenchyma Right artificial pneumothorax was immediately instituted On March 26, 1936, the patient refused further pneumothorax treatment Subsequent examination revealed infiltration of the contralateral base, as verified by fluoroscopy

Case X

M C, male, Filipino, sixty-five years old, married, farmer by occupation, was complaining of chest pain, cough and low grade afternoon fever Physical examination showed dullness, broncho-vesicular breathing over right base Temperature was 37.7°C at 2 00 P M, pulse was 90 Sputum was negative six times by direct method, but positive on the seventh examination Radiography, September 19, 1935, showed tracheo-hilar type of tuberculosis with a tendency of the infiltration to extend to the right basal parenchyma Patient went home to the province so that follow-up observation could not be done

Case XI

E G, male, single, nineteen years old, Filipino, college student was admitted at the

U P Infirmary on August 4, 1934 Chief complaints were pain in the right side of the chest, cough, difficulty of breathing and fever The family history revealed that the Grandfather had died of pulmonary tuberculosis in 1932 Two days before being admitted to the Infirmary the patient played basketball and then took a cold shower afterwards In the evening of the same day, he developed fever, chills, pain in the right side of the chest, cough and difficulty of breathing Physical examination showed well developed and well nourished male individual with a suffering expression In his chest there was a dullness and distant breathing, but no rales over the lower half of the right lung Temperature was from 38°C to 39.5°C at six o'clock P M, with a pulse of over 90 per minute The laboratory examination revealed Pleural effusion—Total cell count 1,270 Differential count N—3 per cent, S L—79 per cent, L L—10 per cent, Mesothelial cells—8 per cent Sputum, August 4, 1934, was negative for acid-fast bacilli by direct examination method Fluoroscopy on June 10, 1934, during the entrance medical examination, showed both lungs apparently clear Radiography was done on August 4, 1939 There was a homogeneous opacity of the right lung with no evidence of infiltration of the parenchyma, giving the impression of pleurisy, sero-fibrinous of the right base Patient was discharged on August 16, 1934, afebrile On October 10, 1936, patient complained again of afternoon fever, chest pain and cough Physical examination of the chest showed slight dullness and distant breathing over the right base Sputum was negative for acid-fast bacilli Radiography was again done on October 10, 1936 Compared with the radiography of August 4, 1934, there was a clearing of the homogeneous opacity of the right base of the lung from the medial portion towards the periphery In this cleared area, there were a few suspicious nodose infiltrations of the basal parenchyma The impression was beginning infiltration of the right base with old pleurisy Sputum examination by direct method was again negative Due to the persistence of the clinical symptoms, another radiograph was taken on January 21, 1937 The diagnosis was tuberculous infiltration, right base, and with old pleurisy Sputum was positive for acid-fast bacilli

Summary

The incidence of basal lesion of pulmonary tuberculosis among Filipinos is one for every 1,300 tuberculous cases. In spite of the prevalence of pulmonary tuberculosis in the Philippines, the incidence of basal lesion is low, as compared with that of other countries.

Basal lesion of pulmonary tuberculosis should not be considered as a definite type (basal type) by itself. The majority of basal parenchymal lesions are an extension of infiltration from a tracheo-hilar type of tuberculosis. Lobar pneumonias, especially those affecting the lower lobes of the lungs, and pleurisies are predisposing factors for the production of basal lesions.

Symptomatology of basal lesion of pulmonary tuberculosis depends upon the degree of infection, type of infiltration and resistance or immunity of the patient.

Diagnosis of basal lesion is a tedious one as it oftentimes requires long follow-up of cases before the sputum becomes positive. The criterion for positive diagnosis is the finding of acid-fast bacilli in the sputum, as usual.

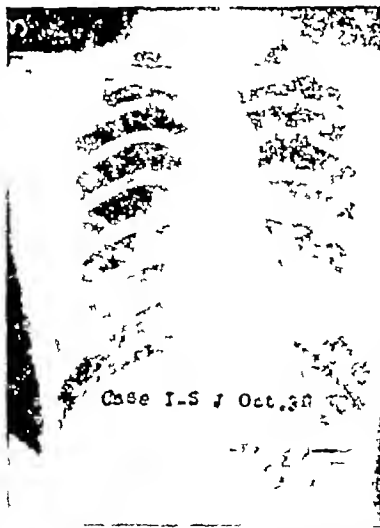
Prognosis of basal lesions in general is reserved.

The treatment of lower lobe tuberculosis is the same as in the upper lobe lesions. Suspicious basal lesions with occasional negative

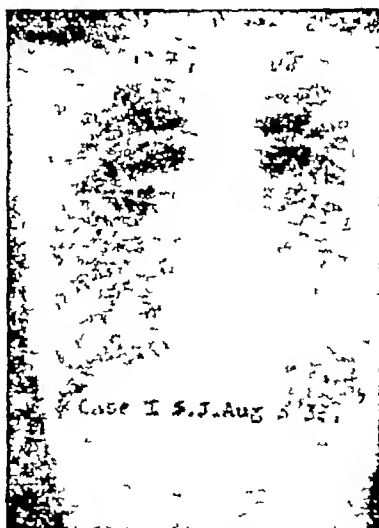
sputum examinations should be treated as tuberculosis so as to give the patients the benefits of early treatment.

References

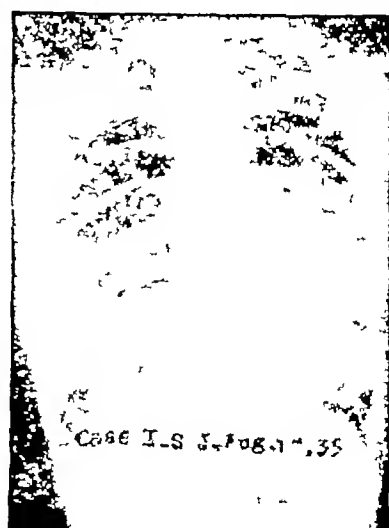
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Case I-S J, Oct 10, 1934 First infiltration of the parenchyma took place at X



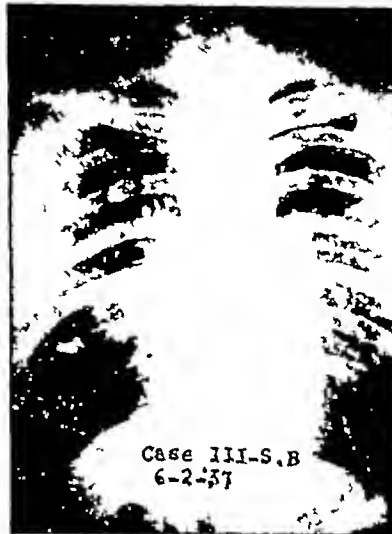
Case I-S J, Aug 5, 1935 More extensive fibrocaseous infiltration of the left basal parenchyma



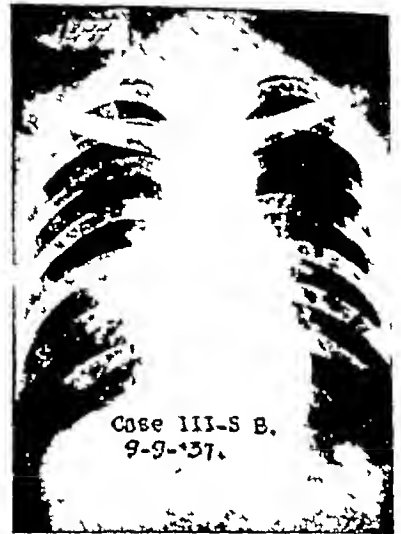
Case I-S J, Aug 18, 1935 Fibrocaseous infiltration of the left lower half of the lung
Sputum—Positive (3 plus-direct method) for acid-fast bacilli



Case II—G M, Aug 7, 1935 Beginning fibrocaceous infiltration, right base Subsequent fluoroscopic examination showed infiltration more extensive *Sputum*—Positive for T B bacilli



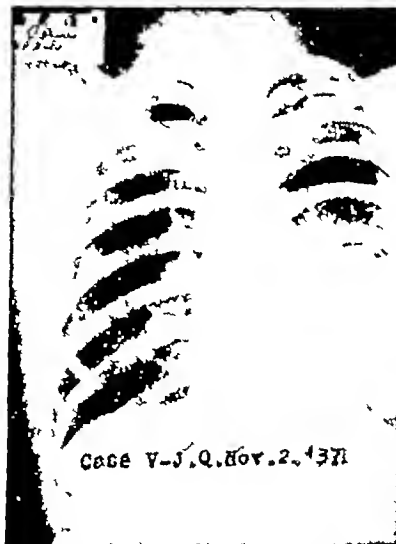
Case III—S B, June 2, 1937 Pulmonary tuberculosis, tracheohilar type, right



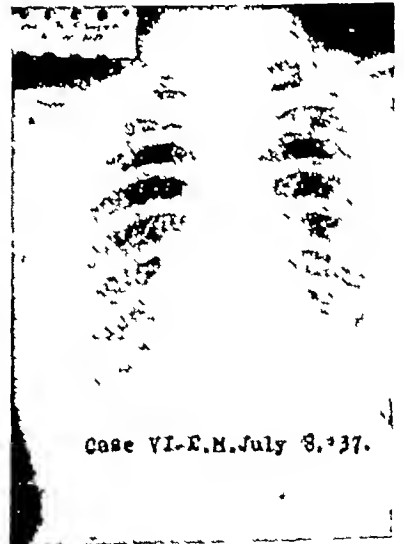
Case III—S B, Sept 9, 1937 Infiltration of right base was more extensive *Sputum*—Positive



Case IV—A S, Oct 22, 1937 Fibrocaceous infiltration right base *Sputum*—positive (Concentration method)



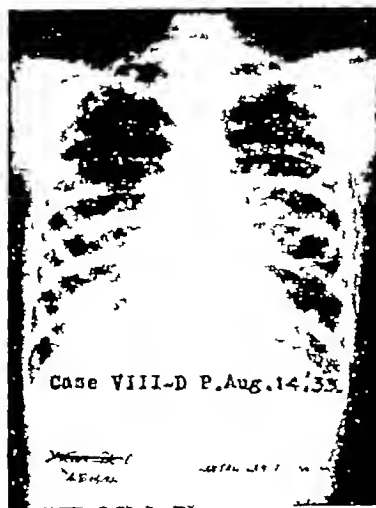
Case V—J Q, Nov 2, 1937 Fibrocaceous infiltration left base *Sputum*—Positive



Case VI—E M., July 8, 1937 The fine nodose infiltration of the right basal parenchyma is hardly visible in the print *Sputum*—Positive (Concentration)



Case VII—R C, Sept 15, '35



Case VIII—D P, Aug. 14, '35



Case IX—V P, July 5, '35

Case VII—R C, Sept 15, 1935
Pulmonary tuberculosis, tracheo-
hilar type, right Subsequent
fluoroscopic examination
showed involvement of the entire
right base Sputum—Positive
(concentration) 9/28/35

Case VIII—D P, Aug 14, 1935
Marked peribronchial thickening
of right hilus with numerous en-
larged lymph nodes Fibroca-
seous infiltration, right base Be-
ginning infiltration, left base
Sputum—Positive

Case IX—V P, July 5, 1935 En-
larged right hilus with fibroca-
seous infiltration, right base
Subsequent fluoroscopic exam-
ination showed infiltration of
contralateral base Sputum—Pos-
itive (8/26/35)



Case X—H C, Sept. 19, '35



Case XI—E G, Jan. 21, '37

Case X—M C, Sept 19, 1935
Pulmonary tuberculosis, tracheo-
hilar type, right with tendency
of infiltration to invade basal
parenchyma Sputum—Positive

Case XI—E G, Jan 21, 1937
Dotted line indicates thickened
pleura Arrow indicates tubercu-
lous nodose infiltration of right
basal parenchyma Sputum—
Positive

Remarks on the Patient-Physician Relationship in Tuberculosis of the Lungs

ELMER HIGHBERGER, JR., M.D.
Greensburg, Pennsylvania

In no other disease is the patient-physician relationship of such importance as it is in tuberculosis of the lungs. It is the confidence which the physician inspires in his patient that is the prime consideration. The patient fears the diagnosis of tuberculosis with its connotations of possible death and chronic illness. The sudden disruption of his accustomed mode of life and the stigma attached to the disease also alarm him. In spite of these considerations, it is the duty of the physician to pursue what will eventually prove the most practical plan and talk frankly with the patient.

Attempts on the part of the physician to alleviate the seriousness of the situation by minimizing the extent of the disease and by delay in establishing the diagnosis by roentgenographic examination will result in postponement of treatment. On the other hand, the physician should stress the efficacy of immediate treatment and encourage the patient to anticipate an arrestment of disease by seeking immediate treatment. Such an attitude on the part of the physician, which will serve to attain the better end results, will later place the physician in the most favorable light when the patient learns to appreciate the nature of his illness and the chronicity of its arrestment, whether that goal is attained at home, or at the sanatorium to which the physician has referred the patient.

Because of the chronicity of the illness, nearly every patient with tuberculosis develops certain psychoneurotic traits that may result from long periods of forced inactivity in bed, from economic stress and familial responsibilities, from almost hopeless abandonment of his ambitions and his work, or from anxiety attendant on his eventual recovery or death. The physician should always leave his patient with a word of encouragement, no matter how bad the situation seems. It is in the instance of the chronic cure that one becomes impressed with the

principles of Dr. Adolph Meyer's teachings in psychobiology. The patient must be encouraged to hope for a return to a useful life after his illness is terminated, for such a therapeutic measure makes it easier for him to relax.

The advantages of occupational therapy should be used to fill the gap in the case of patients who will eventually be able to return to their previous occupations or to direct the abilities of those who can not expect to return to their previous occupations into channels and occupations that will require less physical energy. In both instances the advice of an occupational counselor may become necessary. Since the latter individual is to be found available only in some sanatoria and the larger metropolitan areas, it often becomes the duty of the ethical physician to take over this function. Although, in many instances, objective forms of therapy, such as specific or symptomatic medication, physiotherapy, etc., are of benefit in supplementing the psychotherapy, the physician should not lose sight of the fact that in the majority of cases it is his own encouragement and sympathy that is most efficacious. The plan of treatment should consider not only the immediate but the future welfare of the patient in so far as the latter remains unaffected by unpredictable eventualities.

The physician, no matter how disinterested his attitude may be, is frequently influenced by an overweening desire on the part of the patient for an increase in his exercise schedule and permits the patient more exercise or work than his study of the particular case would warrant. The ambitious and intelligent patient who is determined to recover from tuberculosis should take no advantage of his physician's advice, but should follow it implicitly.

A sanatorium patient, particularly the patient who has been treated in a reliable institution that has well trained nurses and physicians on its staff, is a good judge of the

ability of the phthisiologist. Fundamentally, a sanatorium should be considered a training school for patients where they will learn not only how to get well, but also how to stay well once their disease has been arrested. The same result can be achieved in practice, providing that the physician has a genuine interest in his patients and gives them more than the usual amount of his time.

It is the pneumothorax case that is especially critical. Pneumothorax cases do not like to change physicians because they fear possible pain at the hands of an untried operator. Because of the simplicity of the operation, there is actually little cause for the production of pain.

The physician who inspires confidence in his patients is the one who has the least difficulty in persuading them to submit to operative measures such as pneumothorax, phrenic operations, thoracoplasties, etc. Frequently, the patient's confidence is restored by a good x-ray report, a reduction in the rate of sedimentation of the red blood cells and the knowledge of other signs of improvement. The physician who promises the exact date of a patient's return to an ambulant life and fails to verify his promise leads the patient to ex-

pect the worst. Similarly, patients are led to expect periodic clinical and laboratory examinations, or progress examinations, and are alarmed if these examinations are not done, if the report is delayed for an unusual period, or if the physician hedges when asked for the results of the test. With few exceptions, the physician will experience less difficulty if he makes a practice of telling the patient the truth when the patient asks for it.

A patient is fortunate when he has confidence in a reliable physician and accepts his advice without equivocation. The discontented and refractory patient who considers the freedom from responsibility, which the treatment of tuberculosis aims to promote, an opportunity for unrestrained Wanderlust and moves restlessly from institution to institution, or from climate to climate, has himself to blame for the progress of his disease. While under the tutelage of a sympathetic physician, the intelligent patient soon comes to realize that his recovery or retrogression is largely his own responsibility. Implicit acceptance of the physician's advice becomes the surest prescription for a return to a useful and happy life.

Organization News

MEETING OF THE ARRANGEMENTS COMMITTEE

A meeting of the members of the Committee in charge of the Arrangements for the Sixth Annual Meeting of the American College of Chest Physicians was held at the Biltmore Hotel, New York, on May 28th. Dr. Edgar Mayer, Chairman of the General Arrangements Committee, presided.

INDIANA GOVERNOR REPORTS

Dr. James H. Stygall, Governor of the College for the state of Indiana, reports that the following county committees have been set up for the Advancement of Tuberculosis Organization in Medicine, since the last report on this subject several months ago. The committee members are listed.

F. E. Keeling, M.D., Portland
 John Lansford, M.D., Redkey
 B. M. Taylor, M.D., Portland
 J. B. Eviston, M.D., Huntington
 Harold Brubaker, M.D., Huntington
 R. B. Johnston, M.D., Huntington
 L. H. Osterman, M.D., Seymour
 W. D. Day, M.D., Seymour
 J. C. Elliott, M.D., Guilford
 W. J. Fagaly, M.D., Lawrenceburg
 J. K. Jackson, M.D., Aurora
 E. P. Buckley, M.D., Jeffersonville
 George Regan, M.D., Sellersburg
 H. L. Shanklin, M.D., Henryville
 R. L. Kinneman, M.D., Greenfield
 H. K. Navin, M.D., Fortville
 T. A. Pierson, M.D., New Palestine
 J. W. Strayer, M.D., Lafayette
 G. A. Thomas, M.D., Lafayette
 C. V. Davisson, M.D., Lafayette

GOVERNOR FOR RHODE ISLAND REPORTS

Dr Ubaldo E Zambarano, Governor for the College of the State of Rhode Island, reports on the work of the Rhode Island Tuberculosis Association as follows

"At the annual meeting of the Rhode Island Tuberculosis Association held April 11, 1940, the Cranston District Nursing Association donated the allotment of \$300 00 of their Christmas Seal funds for a scholarship to the Trudeau School. It was awarded to Dr John F Chace, a member of the State Sanatorium Staff

"The Rhode Island Tuberculosis Association also donated \$150 00 toward the purchase of books for the Medical Library, recently established at the State Sanatorium

"The Barnes Trophy awarded each year by the Rhode Island Tuberculosis Association to the community doing the best tuberculosis work during the year, was awarded to the city of Warwick. The program was carried out under the direction of the Health Officer, Dr Raymond Luft, and Miss St John, Head of the Warwick Nursing Staff"

MEETING OF TUBERCULOSIS COMMITTEE OF THE GEORGIA MEDICAL ASSOCIATION

At the Annual Meeting of the Georgia Medical Association, held at Savannah on April 23-26, 1940, Dr Champ H Holmes, Chairman of the Committee for the Advancement of Scientific Programs in Organized Medicine, presided at a meeting of the State Tuberculosis Committee. Dr Holmes also reported to the House of Delegates on the work of the Committee, whose State Chairman he is, and discussed a paper on "Bronchography in the Diagnosis of Chest Diseases" by Dr Sherwood Lynn

GOVERNOR ELECTED TO OFFICE

Dr Paul A Turner, Governor for the College of the State of Kentucky, was elected President of the Kentucky State Hospital Association at a meeting held in Louisville on April 25th and 26th. Many prominent hospital executives and directors attended the meeting. A few months previous, Dr Turner was elected

President of the Southern Tuberculosis Conference

GOVERNOR ELECTED TO OFFICE

Dr Jesse D Riley, Governor of the College for the State of Arkansas, was elected to the Board of Directors of the Arkansas Tuberculosis Association

APPOINTMENT

Dr Thomas F O'Leary of Philadelphia, Pennsylvania, a Fellow of the College, has been appointed to the position of Clinical Chief of the Tuberculosis Department of the Episcopal Hospital in Philadelphia. The Clinic operates under the supervision of the Department of Health

ADDRESSES BY FELLOWS

Dr William H Ordway of the Metropolitan Life Insurance Sanatorium, Mt McGregor, New York, a Fellow of the College, has been conducting a series of meetings at the Sanatorium for the Saratoga County Medical Society. On April tenth he spoke on "Early Diagnosis of Tuberculosis," assisted by his staff. X-ray plates, showing follow-up work, brought home Dr Ordway's points

Dr Donald J Tillou, Elmira, New York, a Fellow of the College, addressed a joint meeting of the Yates County Medical Society and the staff of the Soldiers and Sailors Memorial Hospital on "Conditions of the Chest." The address was given on April 8, 1940, at the Wagner Hotel in Penn Yan

Dr E E Glenn, Springfield, Missouri, a Fellow of the College, reported to the House of Delegates of the Missouri State Medical Association, at their 83rd Annual Meeting, April 29 - May 1, 1940, on the work of the Tuberculosis Committee of the State Medical Society

At the regular meeting of the Lynchburg Academy of Medicine held on April 1, 1940, a symposium on Thoracic Disease was pre-

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mented by Doctors F B Stafford of Blue Ridge Sanatorium, Virginia, and E C Drash, of the University of Virginia, both Fellows of the College

City, and on April 16th he addressed the joint meeting of the Indiana Tuberculosis Association and the Indianapolis Medical Society on "Scientific Procedures in the Diagnosis and Control of Tuberculosis"

Doctors Jesse Douglas and Herbert L Mantz, Fellows of the College, spoke at the Sixteenth Annual Meeting of the Missouri Public Health Association, held at Jefferson City, May 23-25, 1940 Dr Douglas, in conjunction with Dr William M Kinney, spoke on "Silico-Tuberculosis in Missouri," and Dr Mantz gave an "Evaluation of the Tuberculin Test"

Dr Joseph C Placak, Cleveland, Ohio, Governor of the College for the State of Ohio, spoke on "Finding Tuberculosis in the Early Stages" at a meeting of the Columbiana County Medical Society on March 12, 1940

OPENS NEW OFFICE

Dr J M Odell, The Dalles, Oregon, a Fellow of the College, spoke before the Umatilla County Medical Society on April 9, 1940 at Pendleton, Oregon Dr Odell illustrated his talk on "Differential Diagnosis of Pulmonary Tuberculosis" with a number of illustrative x-ray films

Dr Karl Schaffle, Governor of the College for the State of North Carolina, announces the opening of Offices and Laboratories at 603 Flat Iron Building, Asheville, North Carolina, together with Max Riesenbergs, a Qualified Medical Technologist

POSTGRADUATE COURSE

The Pennsylvania Tuberculosis Society held its forty-eighth annual meeting in Williamsport on May 9-10, 1940 At the meeting, Dr John S Packard of Allenwood, Pennsylvania, a Fellow of the College, spoke on the "Diagnosis and Treatment of Tuberculous Tracheobronchitis"

The University of California Medical School will offer a refresher course for graduate physicians from June third to June sixth. The Course will cover "Various Aspects of Chronic Diseases" and will include discussions of heart disease and tuberculosis Further information can be obtained from the Dean's Office

Dr John H Peck, Oakdale, Iowa, President-Elect of the College, delivered an address on "Diagnosis, Treatment and After-Care" before a meeting of nurses and hospital administrators, held in Keokuk, Iowa, on March 29, 1940

INVITATION

Dr J A Myers, Minneapolis, Minnesota, Regent of the College for District 9, spoke before the Woodbury County Tuberculosis Association at Sioux City on March 13th, on March 19th he addressed the joint meeting of the Chicago Pediatric Society and the Chicago Tuberculosis Society on "The Relationship of First Infection to Clinical Tuberculosis", on March 28th he presented four lectures at the Iowa Tuberculosis Association's Silver Jubilee Celebration held in Mason

The Twenty-fifth Annual Meeting of the American Association of Industrial Physicians and Surgeons, together with the Fifth Annual Meeting of the American Industrial Hygiene Association, will be held at the Hotel Pennsylvania, New York City, June 4-7, 1940 This will be a four day meeting intensively devoted to the problems of industrial health in all of their various medical, technical, and hygienic phases, with particular stress on the prevention and control of occupational hazards

The medical profession is not only invited, but urged to attend these gatherings as they will be of unusual interest and value to all practitioners interested in industrial injuries and illnesses

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FELLOWS ELECTED TO AMERICAN COLLEGE OF PHYSICIANS

The following Fellows of the American College of Chest Physicians have been elected to Fellowship in the American College of Physicians during the year, 1939-1940

Anthony V Cadden, M D ,

Hopemont, Virginia

Jacob Antrim Crellin, M D ,

Philadelphia, Pennsylvania

Elmer Edward Glenn, M D ,

Springfield, Missouri

Lucius Emmett Madden, M.D ,

Columbia, South Carolina

Myron David Miller, M.D ,

Columbus, Ohio

Elliott Plummer Smart, M.D ,

Murphys, California

David Ulmar, M D ,

New York, New York

Dr George Elmer Martin of Pittsburgh, Pennsylvania, a Fellow of the College, was elected to Associateship in the American College of Physicians on March 31, 1940, and Dr Walter E Vest, Huntington, West Virginia, Governor of the College for the State of West Virginia, has become a Life Member of the American College of Physicians

CONFERENCE OF NEGRO TUBERCULOSIS WORKERS

The Second Annual Conference of Negro Tuberculosis Workers was held at the Howard University School of Medicine, Washington, D C , on May 27-28, 1940, under the auspices of the Tuberculosis Association of the District of Columbia and the National Tuberculosis Association

TUBERCULOSIS HOSPITAL CONSTRUCTION NEWS

The county officials of East St Louis, Illinois, are preparing to start construction

on a new 105-bed tuberculosis sanatorium as soon as a \$334,000 00 bond issue is printed and delivered

At a meeting sponsored by the Jefferson-Hamilton County Medical Society, of Mt Vernon, Illinois, a proposal to construct a tuberculosis sanatorium in southern Illinois, for the purpose of serving twenty-seven counties, was discussed

At Pine Rest, New Jersey, the Atlantic County Board of Freeholders rejected, in February, all previous bids for the erection of a new 100-bed tuberculosis hospital and reopened the bidding

TUBERCULOSIS COMMITTEE REPORTS TO HOUSE OF DELEGATES

The Tuberculosis Committee of the Texas State Medical Society, represented by Dr Henry F Carman, Dallas, Regent for the College of Texas, Dr Jesse Brown White, Amarillo, a Fellow of the College, Dr Sim Hulsey, Fort Worth, a Fellow of the College, and Dr Howard E Smith, presented a Supplementary Report on the findings of the Committee to the House of Delegates of the State Society This was done in Dallas on May 15, 1940 Covered in the report, were recommendations for the distribution of tuberculin, the furtherance and revision of postgraduate study courses on tuberculosis and training in pneumothorax administration, and the improvement of sanatorium facilities, an additional 2500 beds for Texas being recommended, as well as the establishment of a sanatorium for Latin-Americans in the southwestern part of the state A complete report will be published later

In addition to the above Fellows, there were present at the meeting, Dr Floyd Napoleon Moore, of Austin, Dr J B McKnight, of Sanatorium, both Fellows of the College, Dr Orville E Egbert, Governor for the College of the State of Texas, and Dr Robert B Homan, Jr, Secretary-Treasurer of the College

A SAVING IN TIME AND MONEY—Will be effected by starting pneumothorax in the sanatorium where the patient can be closely followed until active tuberculous lesions are well under control

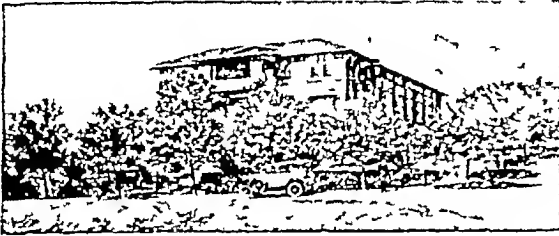
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ELMER R. HODIL, M.D.
Associate Physicians

WILLIAM DEVITT, M.D.
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O b i t u a r y

ROBERT C FOSTER M.D.

1882-1940

Dr Foster was born on August 28, 1882, at Ranger, Arkansas. His father was a doctor, John R. Foster, his mother's maiden name, Annie Vardell. Dr Foster graduated in 1903 from the University of Arkansas Medical School and did post-graduate work at the Veteran's Hospital, Palo Alto, and at the Stanford University Hospital.

Following this, Dr Foster practiced general medicine for about fifteen years, his especial interest being tuberculosis. Toward the end of this period he was the surgeon in charge of the Emergency Hospital for the Missouri-Pacific Railroads at Little Rock, Arkansas, which position he held for a year. He then served as City Health Officer for North Little Rock, Arkansas for two years. Dr Foster's next position was with the U S Public Health Service Hospital at Houston, Texas, where he was installed as Chief of the GU service and Chief of the

Medical Service. This work occupied him for two years, at the end of which, he went to Washington in 1923 to take his place on the Board of Appeals of the U S Veterans Bureau. He remained there until 1925, when he developed tuberculosis.

From April, 1925 to May, 1926, Dr Foster "took the cure." Then in 1926 he went to the Veterans Administration Facility in Phoenix, Arizona, where he served for eight years as tuberculosis specialist. He was transferred in March 1934 to the Veterans Hospital, Whipple, Arizona, where he remained until his death on January fifth, 1940. At Whipple, Dr Foster held the posts of Chief of the Tuberculosis Service, Acting Clinical Director, and Ward Surgeon.

Dr Foster is survived by his wife, Frances, his daughter, Mrs. Howard Boroughs, a granddaughter Betty Lou, his father, and a brother and sister.

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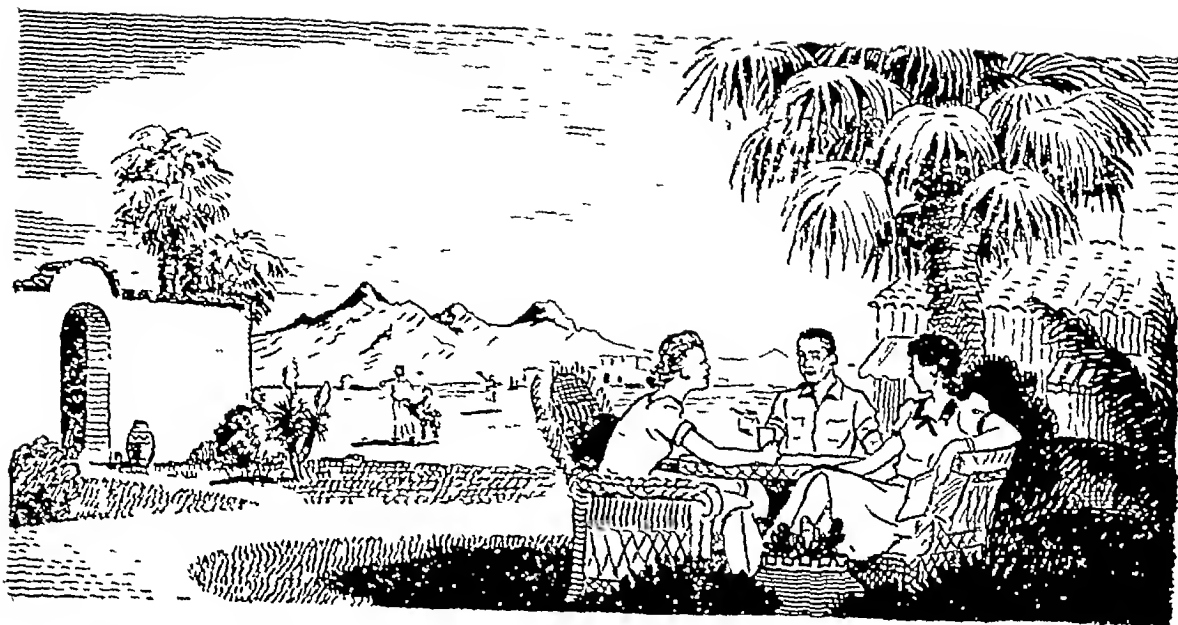
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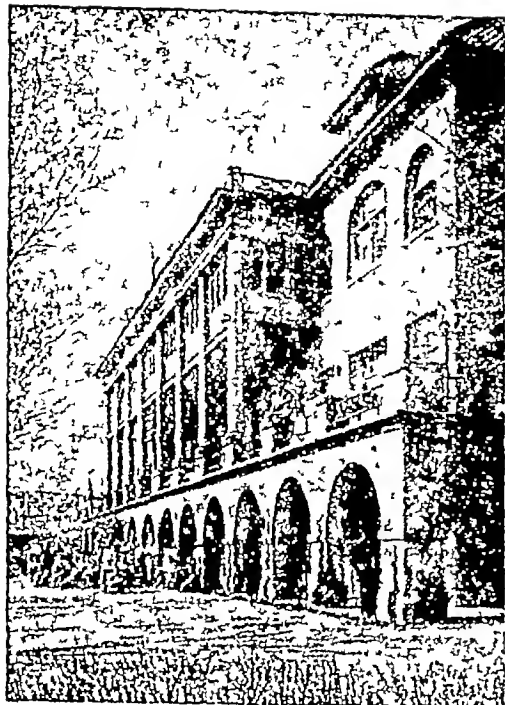
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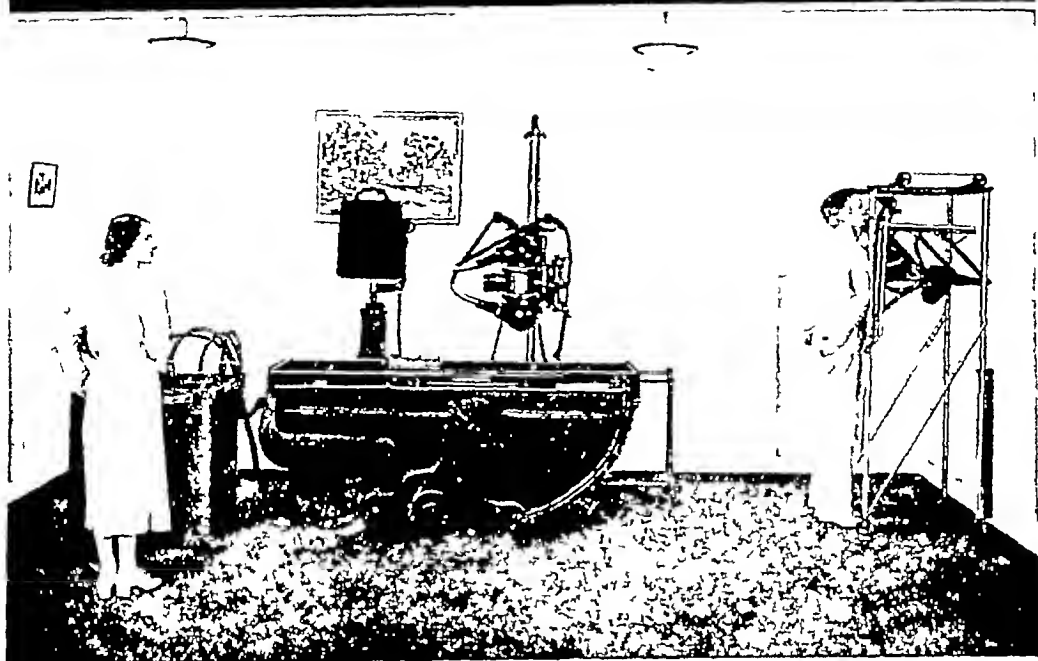
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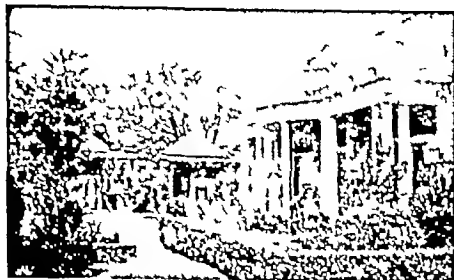
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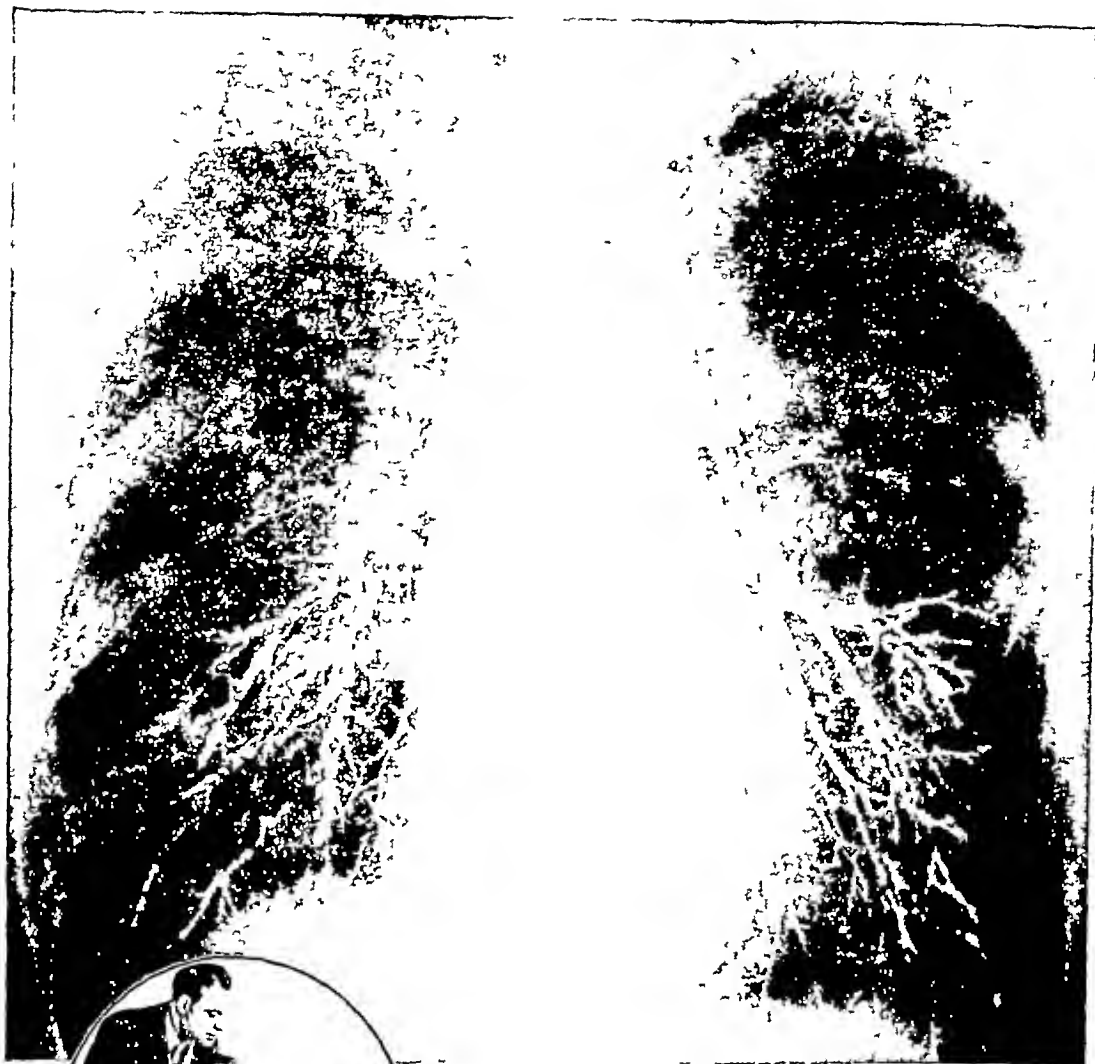
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Editorial Comment

Another New Development The order of the day along the tuberculosis front is to find the case before the advent of symptoms This means looking for the disease in those who are apparently healthy or apparently free from signs or symptoms of tuberculosis The slogan of the N T A's early diagnosis campaign this year, embodies such an idea We have indeed come a long way from those battle cries of yesterday—"Beware of that cough which hangs on" or "Those symptoms may be due to tuberculosis, etc" They were all well and good—and still are in many instances, but a new era is dawning and a new chapter is being penned by the scribe of progress

Tuberculosis is being sought for, and found, not only in its very early stages and before symptoms appear, but even within a few weeks after the seeds of infection enter the body The amazing potentialities for treatment, prevention and control toward which this builds can readily be realized Paramount in this achievement are the x-ray examination and the tuberculin test The one denotes the earliest presence of demonstrable lesions in the lung, the other, the existence within the body of the tubercle bacilli The present utilization of these two important procedures has

come about by the rapid improvement in the science of roentgenology and the purification and standardization of tuberculin

The largest yields of unsuspected tuberculosis have been obtained by case-finding surveys in contacts, young adults, in industrial groups and in that large indigent group which is made up of the underprivileged, the unwashed and the unemployed

Recently, in an exceptionally fine survey reported by Plunkett and Mikol, and published in the March issue of the *American Review of Tuberculosis*, another fruitful source of finding unsuspected tuberculosis was opened up, another medium for tuberculosis case-finding which has not in the past been sufficiently explored, was revealed This survey dealt with case-finding in the general hospitals It was estimated from this study, that in 1937 about 40,000 cases of unrecognized tuberculosis were admitted to the general hospitals The survey was carried out by making an x-ray examination of the chest of all patients over fifteen years of age admitted to the hospital Exceptions were made for those patients too ill to undergo the examination, also, known and suspected cases of pulmonary tuberculosis were excluded in the statistical reckoning

The final result of this study was that 0.6

per cent of the adult admissions to the general hospitals had unsuspected and clinically significant tuberculosis. In the general hospitals, wherein the survey was conducted, it was disclosed that an average of only 15 per cent of the patients were routinely given x-ray examinations of the lungs.

The general hospital does afford a group from the general population under ideal conditions for carrying out case-finding in tuberculosis. Let's hope that this stimulating work by Plunkett and Mikol will open wide another important avenue in the approach toward tuberculosis control.

C H H

Case-Finding in Florida

Tuberculosis agencies in Florida are fortunate in having progressive leadership. Doctor A. J. Logie, Director of the Division of Tuberculosis of the Florida Board of Health, is utilizing the Rapid Paper Film Method of case-finding. He states that the groups now being concentrated upon are the indigent contact cases, indigent suspected cases, families of those on relief, families of those unemployed, unemployables and transients. The negro and the adult population are particularly sought after. Preliminary tuberculin testing is done only on children under sixteen years, who fall into the above groups.

Last year the total cost per case of tuberculosis discovered which required attention, was only \$107.20. The total cost per film was \$1.93.

Doctor Matthew Jay Flipse of Miami, Florida, the Governor for Florida of the American College of Chest Physicians and Chairman of the Tuberculosis Committee of the Florida Medical Association, has actively cooperated in furthering the case-finding work. A united effort in this work has been made by the Florida Medical Association, the Florida Radiological Society, the Florida State Education Authorities, and the Florida Tuberculosis and Health Association.

Each individual included in the program must fill out a request slip, which must be signed by a local physician or by the county health officer.

Mrs. May Pynchon, the able Executive Secretary of the Florida Tuberculosis and Health

Association, is to be accredited for her most energetic assistance to the County Health Units, including financial help. The Tuberculosis Association pays the clinician, supplies x-rays, supplements the transportation of nurses or otherwise contributes to the case finding program as is deemed most necessary by the doctors in authority. In several counties, Seal Sale Money has been used for the purchase of x-ray equipment.

The Florida program among industrial groups is in its embryonic state and is done sporadically, although a number of industrial surveys are being made by local health agencies in various cities.

An organization which for \$107.20 each, finds its tuberculous cases requiring treatment, can be relied upon to have the kind of efficiency which will increase its work with industrial groups. Some of the schemes for case-finding cost about \$4,000.00 to find each positive sputum case and about \$2,000.00 to find each case requiring attention. F. W. B.

That Gallup Poll Again

Dr. George Gallup sums up his poll on cancer, which was released through the press on April 7th, as follows: "Despite encouraging gains in public enlightenment on these questions since a previous institute survey 12 months ago, the current study shows that wide-spread misconceptions still exist and that much work still remains to be done in educating the public."

The following question, with its resultant answers, concerns the tuberculosis problem most: "In your opinion, which of the following diseases is the most serious public health problem—Tuberculosis, cancer, infantile paralysis, or syphilis?"

Syphilis	46%
Cancer	29%
Tuberculosis	16%
Infantile paralysis	9%

In analyzing the above figures, one may draw various conclusions. As is shown, nearly 50 per cent of our people think syphilis is our most serious health problem. Why do they think this? Is it because it has been stressed as a major problem by our U. S. public health service, or is it because syphilis strikes home more readily, being a social disease contracted

in its own particular way? Certainly this survey shows public opinion is in error when we consider the fact that recent U S public health statistics show the death rate in syphilis as only 9 per hundred thousand, against a tuberculosis death rate of 48.9 per hundred thousand. We also know that from a contagious standpoint, syphilis is not as menacing as tuberculosis. The error is carried still further. The poll shows that only 29 per cent contend that cancer is the most serious health problem, while the death rate from cancer is 114.6 per hundred thousand.

There can be but one reason for these erroneous opinions of the general public, and that is inadequate education.

While we as physicians are interested in the control of all diseases, as fellows of the American College of Chest Physicians, we are most interested in the tuberculosis control problem. We, therefore, should turn our thoughts toward ways and means of improving the education of the public. Progress has been made, to be sure, as is evidenced by the reduction in the death rate. But the death rate is still alarmingly high. In fact, tuberculosis still produces the highest death rate in the productive age groups.

We invite your attention to an editorial by Dr. Frank Burge, in the March issue of this Journal, in which he pointed out that "Educating farmers never eliminated tuberculosis from bovine herds. The veterinarian had to go into the herd, find the tuberculous animals, and separate the infected from the healthy. Then, and only then, did we see significant elimination of bovine infection."

Since millions have been spent on "education of the public" with questionable results, why should we not now take a large portion of the money and spend it on case finding? The veterinarian has proved to us the value of this method. The conducting of surveys of industrial workers, white collar employees, schools and colleges will go much further, not only in finding cases, but from an educational standpoint, than the methods now used.

There is no doubt that tuberculous patients and their immediate families are receiving major benefits from education concerning tuberculosis. This intensive type of education is necessarily under the direct supervision of the

physician, and it takes root because the patient and his family are directly concerned. But with the general public, it is a different story. Therefore, in our opinion, tuberculosis funds would be better spent, if they were used for continuous surveys of all groups, picking-up and segregating cases when found, and continuing the education of these patients and their families. C M H

An Invitation The vast majority of the readers of this Journal are general practitioners of medicine, it is largely, if not essentially, intended for them. It may also be presumed, and correctly so, that these readers are, in the main, more than casually interested in diseases of the chest, for otherwise they would not be reading these words. Some few, of course, open the pages with something of an enquiring curiosity. It may be parenthetically stated that such curiosity often becomes the knocker upon the portals of knowledge. "Be wise and enter therein."

Predicated, therefore, upon your interest as general practitioners in diseases of the chest, an urgent invitation is extended to you to attend the meeting of the American College of Chest Physicians to be held at the Biltmore Hotel in New York City, June 8th-10th. See elsewhere in this issue the program and other details. After this meeting, you will be on hand to attend the American Medical Association's meeting, which immediately follows, and perhaps to take in a bit of the New York night life. So begin now to shape your plans to attend this big "double header" of medicine. Come play, come fraternize—come learn about the chest from the masters.

C H H

The Biltmore Hotel in New York The editor made a trip to New York several weeks ago to select space for "open house" at the Annual Convention of the American College of Chest Physicians. He was delighted with the facilities the Biltmore Hotel has to offer, both for hotel accommodations and convention needs.

It is hoped that our Fellows will make their reservations for hotel accommodations sufficiently early, so that we will not lose the reserved space for them. F W B

Management of Pulmonary Tuberculosis in Relation to Hemorrhage*

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[GLEAN from the program that I am required to present in ten minutes the management of hemorrhage in cases of pulmonary tuberculosis. It follows that I must be dogmatic and brief. Hemorrhage is a frequent occurrence, varying in degree from 1 or 2 cc loss of blood to massive blood loss, resulting in exsanguination within a few minutes. This latter is, fortunately, quite rare, and has become more and more infrequent since the institution of strict bed-rest regimen.

The management of hemorrhage in pulmonary tuberculosis can be described under three headings:

- 1 Psychic Measures
- 2 Medicinal Measures
- 3 Surgical Measures

1 *Psychic Measures* These are most important, since the patient is always scared. Fear increases the heart rate, raises the blood-pressure, and makes for more abundant bleeding. A call to a bleeding patient should be answered *at once* unless it is known that someone is present who can authoritatively take charge. Most patients are more afraid of blood than they are of death itself, and the psychic insult of a hemorrhage of 50 to 100 cc (harmless insofar as loss of blood is concerned) is often striking beyond measure. Equanimity, so eloquently written of by Sir William Osler, is absolutely essential. The vast majority of hemorrhages are relatively small—under 250 cc—and will at the moment do the patient no harm, though one must always bear in mind the possibility of a bronchogenic spread of disease. A calm and equable attitude is essential. The occurrence should not be made light of in a jocose way, but encouragement and the instilling of a feeling that this is not a terrible bolt from the blue should be stressed. The mere presence of the physician with his reassuring

smile and hand-clasp will quiet the racing heart and reduce the heightened arterial pressure. As a matter of fact, many bleedings have been known to cease with the coming of the doctor.

2 *Medicinal Measures* So many drugs have been given for the treatment of hemoptysis, that to go over them in any detail would necessitate a monograph rather than a ten-minute paper. The writer, after over thirty years of experience with pulmonary hemorrhage, has developed (perhaps unfortunately) a very fatalistic attitude toward this accident. He looks upon hemoptysis as essentially self-limiting, as far as the acute manifestations are concerned, and does not believe that drug therapy, other than sedatives and blood coagulants, is of any great value. For continued, moderate bleeding, surgical methods, which will be discussed later, may be most efficacious.

The first medicinal procedure instituted in the presence of any pulmonary bleeding should be for the purpose of quieting the nervous system. In free bleeding of 120 cc or more, it is advisable to lessen the cough reflex so that coughing is not violent. Many patients are told to lie flat on their backs and not to move a muscle (and they adhere to this instruction implicitly). This is a mistake. The patient should be in that position which gives him the most relaxation, causes him to cough the least, and to raise the blood with the greatest ease. Any position which will do this is the correct one. I have had patients sitting upright, lying on the right or left side, on the back, partially propped up—it makes no difference. Relaxation and comfort are the great objectives. Some sedative is usually necessary at once. The barbiturates take too long to act, though as a follow-up measure they are valuable. Some opium derivative is needed—codeine (gr ½ hypodermically) does well in many cases, but more often one small dose of morphine, pantopon or dilaudid is necessary, because it is imperative to cause the patient to relax. In my experience, morphine

* Read as part of a symposium at a meeting of the Southern Tuberculosis Conference in Charleston, S. C., Oct. 3-6, 1939.

and its first cousins, in proper dosage, have not given rise to post-hemorrhagic pneumonias, as has been stressed by many in the past. By "proper dosage," I mean an amount that will not "knock the patient out," but will merely lessen tension to such a degree that the suggestive therapy carried out by the physician and the competent nurse can come into its own. Sedation is of the utmost importance at first. In a hemorrhage of any consequence I usually give one of the blood coagulants, either fibrogen or thromboplastin (though there are others just as good) in full dosage over a period of 24 to 36 hours. If they do not work at the end of that time, I abandon them, since they may develop an anti-coagulating effect, if persisted in. An ice-bag over the heart and the chewing of cracked ice help psychically.

Atropine in large doses (gr 1/33 to gr 1/25), hypodermically, was at one time greatly in vogue, on the valid theory that the drug caused dilatation of the superficial vessels and, therefore, moved large quantities of blood from the deeper blood-beds to the subcutaneous areas and thus lowered deep blood-pressure, which, in turn, served to check pulmonary bleeding. I used atropine quite routinely for a long while. The effects on the patient were disagreeable, because of the great dryness of the mouth, pupillary reactions, occasional vesical paralysis, etc. I do not think that it helps much. Ergot had its period of short-lived triumph, but it, too, turned out to be a bird of passage, as did calcium chloride administered intravenously. As the years went by, becoming more and more imbued with the idea of self-limitation of pulmonary hemorrhage, I naturally developed less and less confidence in any particular medicinal measure and felt that in prolonged bleeding the last drug used was given credit for stopping the hemorrhage, when, as a matter of fact, the hemorrhage was about to stop of itself. So I return to my original postulates of equanimity, sedation and nursing care.

The rare fulminating hemoptyses cannot be treated. When blood comes pouring from a millary aneurysm in a large artery spanning a cavity, there is nothing to be done, for the unfortunate patient usually is dead within a quarter of an hour.

3 Surgical Measures We have at our disposal two surgical measures for arresting protracted hemorrhage or for quieting one large bleeding, which we fear may recur. These measures are Phrenic crushing and artificial pneumothorax.

I mention phrenic crushing first because I believe it to be the soundest physiological procedure. Its only disadvantage is that, if the patient is to be in his own home, or in a nursing cottage not equipped with a surgeon, removal to a hospital is imperative. The physiological appeal rests on the ground that diaphragmatic paralysis provides relaxation for lung tissue and that alone. Artificial pneumothorax, on the other hand, though providing relaxation of lung tissue in some areas, may also bring about tension of lung tissue in other areas because of the presence of pleural adhesions, and may thus, if the tension be exerted in or about the area of hemorrhage, tend rather to increase than to diminish bleeding. It is best to reiterate a truism, that one must be definitely informed as to the side whence the bleeding is coming before doing a phrenic operation. This can often be determined by the physical signs, more often by the x-ray, and at times, by the sensations of the patient, which I find most trustworthy in a corroborative sense, but upon which I would never solely depend.

If undecided as to the location of bleeding, a pneumothorax is probably the best initial surgical effort, because if the air injection fails completely to allay the loss of blood, it is always possible to close the pneumothorax space by aspiration and try the other side, but when phrenic crushing is done, "that is that" for from six to twelve, or even eighteen, months.

In cases where the physician contemplates either phrenic crushing or artificial pneumothorax, the condition does not usually constitute an absolute emergency, in other words, a day or so will not matter and there is time for removal to a hospital and for the making of proper observations, which will, in all but a small minority of cases, point the way to the proper procedure.

To summarize

Pulmonary hemorrhage is

a Frequent

b As a rule, relatively slight

- c Almost always self-limiting
- d Rarely fulminating and then usually at once fatal

Medical therapy rests on

- a A calm attitude on the part of physician and attendants
- b The prompt institution of adequate sedation
- c The administration of one of the many blood coagulants
- d The exhibition of whatever drug has proven satisfactory to the particular practitioner

Surgical therapy is resorted to

- a When the bleeding is quite violent at the outset, to-wit 250 to 500 cc., and

where a recurrence in equal intensity might markedly impair the blood volume

- b In cases of persistent bleeding amounting to 60 to 120 cc in 24 hours over a period of some days and in which drug therapy has not been successful

As to surgical procedures

- a If positive as to site of bleeding, phrenic crushing is the operation of choice for reasons already stated
- b If doubtful as to the site of bleeding, artificial pneumothorax should be tried, as it offers the physician post-operative control which phrenic crushing does not

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Allergy as a Cause of Frequently Recurring Colds and Coughs in Children

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BRONCHIAL ASTHMA, hay fever, hives, and angioneurotic edema are generally accepted as the commonest clinical forms of allergy and are usually recognized without special difficulty. This paper is not concerned with these obvious varieties, but rather with those conditions which are definitely allergic, but are not readily apparent, often being quite difficult to identify.

In 1931, I presented a paper before the Section on Diseases of Children at the Eighty-Second Annual Session of the A M A, entitled *Allergic and Infectious Conditions of Upper Respiratory Tract in Children—Differential Diagnosis*, in which I pointed out that some of the commonest conditions seen in children are those which are classified under the general heading of infections of the upper respiratory tract.¹⁷ Among them are included rhinitis, sinusitis, nasopharyngitis, tonsillitis, laryngitis, tracheitis, and bronchitis. All of these conditions may be infectious in origin, but are frequently manifestations of respiratory allergy, from which they must be differentiated if proper treat-

ment is to be instituted. In addition, many of the true infections are complicated by an underlying allergy and cannot be cleared up until the allergy predisposing the mucous membranes to infection is relieved. It has now become possible to solve a great many of the so-called recurrent colds and chronic coughs in children by thorough allergic supervision.

That the ingestion of foods and the inhalation of certain dusts, animal dander and plant pollen may cause frequent colds and chronic coughs in susceptible individuals is now an established fact. This is in direct contrast to similar symptoms that are caused by infection and bacteria. Regularly recurrent, frequent colds may be interpreted as perennial or seasonal hay fever, and the chronic persistent cough of this type, as a preasthmatic symptom. The variety of allergic symptoms which can involve any organ or system of the body makes it vital for every physician or pediatrician to have at least a working knowledge of allergy.

The early recognition of the allergic state

in childhood, with proper diagnosis and treatment, may prove to be the principal factor in the prevention of asthma and other major disturbances of the body. It becomes, therefore, of paramount importance for the physician to interpret and properly treat the earliest allergic manifestations. It will in this way become possible to outline the necessary preventative measures for the child's future welfare.

Diagnosis

The result of treatment in any disease depends upon correct diagnosis, this is especially true in allergy. The clinical history must be the first step taken in the diagnosis of an allergic problem and is of paramount importance.

1 A family history of allergy may be obtained by careful questioning in more than fifty per cent of the cases.^{2,3} Details are especially important in obtaining an allergic history. Chronic sinus infections, nasal catarrh, migraine, autoneurotic edema, or cyclic vomiting (acidosis), and the better understood allergic symptoms such as hay fever, asthma, eczema, and urticaria are usually present in the family history.

2 Early allergic manifestations are frequently noted in the patient's own account of his history. It has been shown recently in a survey of 1000 children that had been followed for a period of at least five years, that of 500, "78 per cent of the infants manifested some allergic phenomenon before they were 4 months old, 22 per cent had symptoms before one month, and almost half of the group before 2 months of age, in 91 per cent symptoms were present by the first birthday, and all of the total number, by 2 years of age."⁴ These manifestations were, in the order of their frequency, rash (eczema), frequent vomiting (pylorospasm), and gastro-intestinal upsets, such as severe colic, diarrhea or constipation. Less frequently, sneezing, urticaria and wheezing were present. Instinctive dislikes for certain foods, and resultant food poisoning by these foods, are important facts to learn in dealing with children, since forceful insistence on the eating of these foods can cause harm.

3 Present allergy, such as recurring head colds, characterized by "stuffy nose," worse

on arising and gradually improving is significant of allergic rhinitis (perennial hay fever, chronic sinusitis, chronic catarrh). Chronic nocturnal cough, without demonstrable physical findings, is another not uncommon symptom.

The children presenting the symptoms of frequent colds and chronic coughs have usually visited many physicians. Experience has given me the impression that many physicians do not think of allergy in relation to these conditions, unless the symptoms are typical of hay fever or bronchial asthma, and some even consider typical asthmatic attacks to be infectious in origin because in some children they are accompanied by fever. These patients have been "run through the mill," as it were. Their tonsils and adenoids have been removed, "cold shots," have been administered, vitamins have been forced on them, light treatments, heat treatments, sinus treatments, have all been tried, and, finally, the children have been disposed of by being sent to a warmer climate, but all this to no avail because the patient often is worse than before all the treatments were begun. These facts certainly make it self-evident that we are dealing with a problem which in all probability is allergy.

Symptoms

The patient with an allergic cold is constantly troubled. He no sooner recovers from one such "cold" than he develops another one. The onset and termination of such colds are characteristic. They begin abruptly and end in the same manner, lasting from several hours to several days. The predominant disturbance is in the nose and is constantly troublesome, although somewhat less during the day. Itching of the nose is another important and characteristic sign. A child who has an allergic nasal condition will rub his nose vertically from his forehead to his lip, while in the case of a true infectious cold he will usually rub his nose from side to side.⁵ Sniffing, and a hacking, scraping dry cough are present, as efforts to clear the nose and throat of the mucus secreted. This is most often present on arising. Nasal congestion and obstruction are nearly always present upon arising and after several hours may clear up completely, in some cases.

Upon retiring, one or both nostrils become congested and often remain so throughout the entire night. As a result, mouth breathing, snoring and heavy breathing result. The "adenoid facies" is noticeable in varying degrees, depending on the length of time the condition has persisted. Bowen and Balyeat⁶ and Todd⁷ have described malformations of the jaws and teeth from nasal allergy. Early morning sneezing is not as frequent in children as in adults. Blowing the nose, however, is quite common, and the discharge is of a thin consistency.

The constitutional symptoms in children old enough to describe them are primarily a tired feeling, or one of exhaustion, headaches of frontal or occipital type, often on one side only, biliousness, irritability, nervousness, anorexia, impaired hearing, poor work in school and an antisocial attitude are also frequent complaints. The so-called "seasonal colds" are usually hay fever and may be presented to the doctor with one symptom referable to the nose or eyes, or in the classical picture of hay fever.

Chronic coughs, which are often called chronic bronchitis, are in many instances preasthmatic manifestations. The cough is most pronounced in the morning on arising, or it may awaken the patient from a sound sleep. It is usually a paroxysmal, hard, dry cough, resembling whooping cough. It may be a series of short, hacking coughs, lasting from one to two hours, in an effort to relieve a tickling sensation in the throat or larynx. These symptoms are frequently associated with nasal allergy and are often accentuated by excessive exercise, laughing, fatigue and changeable cold and damp weather.

Two types of nasal pathology may be observed. First, in the acute rhinitis problem, the nose presents a pale or red, shiny, swollen mucous membrane bathed in a serous discharge, the turbinates and the septal wall sufficiently edematous to obstruct the nares. Second, in the chronic type of nasal allergy, the passages often appear normal, or are usually of a livid or pale boggy mucosa seen most frequently in the region of the nasopharynx and can be observed only by post-nasal examination with the nasopharyngoscope. Hypertrophic adenoids may give rise to similar symptoms, but can be ruled out

by digital examination. A majority of these children have had their tonsils and adenoids removed, often more than once. The pharynx may be studded with elongated or pea-sized swollen masses of lymphoid tissue, showing a granular throat.

The geographic tongue or that having smooth, base, shiny, round or circinate lesions with raised borders has been indicted as pathognomonic of an allergic diathesis. This sign is not present in all allergic individuals.

Sinus pathology consisting of an allergic edema may be present. It has been pointed out by Dean that radiography is not reliable in children due to the thickness of the facial bones.⁸ An examination of the nasal secretions will usually verify the diagnosis of allergy. After having taken an unusually careful past, present and family history and having made a thorough physical examination of the patient, along with the necessary laboratory tests, a thorough allergic study must now be made to discover the specific offending allergens.

Skin testing should be considered imperative in these patients, because clues found in this way are specific and can not be found as quickly in any other way. Faulty skin tests, as a result of improper technic, the use of poor materials, and an insufficient number of tests with the proper antigens will fail to obtain adequate information. Recurrence of symptoms after long free intervals may necessitate retesting the patient as new sensitivities may be acquired. Children often lose sensitiveness to old troublesome antigens and must, therefore, be checked so that the diet may be replenished, or the environment reorganized, if necessary. Food allergy is more frequent in infants and children under five years of age.⁹ This sensitiveness tends to markedly diminish by the second decade and inhalant antigens assume a major role. Dust, pollens and epidermals assume a greater role than foods after the fifth year of life. Infectious allergy is not as frequent a cause of nasal and bronchial allergy in children as is commonly believed.

In conclusion, it should be emphasized that these frequently recurring colds and chronic coughs differ from the more obvious forms of nasal and bronchial allergy (i.e. seasonal

hay fever and bronchial asthma) chiefly in the difficulties they offer in identification, rather than in the problems connected with treatment. Certainly, once their allergic nature has been recognized, it becomes apparent that the therapeutic methods applied to the typical case, are equally applicable to these less typical, but none the less true allergic conditions. It should be further emphasized that the prevention of asthma and other forms of major allergy is the ultimate goal in the treatment of frequent colds and chronic coughs of proven allergic nature.

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The Control of Tuberculosis in Industry A Responsibility and a Profit*

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PULMONARY TUBERCULOSIS is a bacterial disease. It is not peculiar to industry, and it does not arise out of occupation. Nevertheless its prevention may become industry's most important health problem. The reasons are these:

(a) *Tuberculosis Is a Terminal Infection in Silicosis*. Silicosis, a chronic incurable disease of the lungs, is an occupational disease. It does not ordinarily cause disablement until complicated by tuberculosis, the development of which it seems to favor. When disablement occurs, it is usually total and permanent. As workmen have had opportunities in the past to acquire silicosis, cases are now present in industry and their number is unknown. When tuberculosis becomes engrafted on these, they become important compensable occupational disease problems.

(b) *There Is a Tendency to Assume That Dust Aggravates Tuberculosis*. Silicosis is caused by the inhalation of silica dust.

Knowledge of that fact has introduced a tendency to regard all dusts as harmful, at least as irritants to the respiratory passages and, therefore, possibly capable of aggravating tuberculosis or predisposing to its development. Whether justified or not, this tendency is fostered by doctors who testify that dust might have aggravated a pre-existing tuberculosis. Even though they do not know that to be scientifically proven, they are reluctant to say it is not possible. Therefore, if tuberculosis occurs in a workman exposed to dust, the exposure may be assumed to be casual and compensation may unjustly be allowed.

(c) *Tuberculosis Is More Prevalent Than the Occupational Diseases*. The occupational diseases are being controlled to a remarkable degree. In the various states where records are maintained they account for about 2 per cent of the total compensation costs. In our own group of about 200,000 hourly-rated employees, they caused but 466 days of lost time last year. This gives a ratio of 0.001 days per 1,000 hours of work. The total number of individuals involved was only 25, which is 13 per 10,000.

* Presented before the National Tuberculosis Association, Los Angeles, California, June 23, 1938. Reprinted from the *Transactions of the National Tuberculosis Association*, 1938.

Available figures indicate that something like 40 or more per 10,000 workers have active tuberculosis and about 100 per 10,000 have minimal and healed lesions. Therefore, by comparison with the occupational diseases, tuberculosis becomes quite important.

It is comparatively easy to control occupational diseases. They result from exposure to substances of known toxicity. The contacts are directly with the skin, by mouth or through the respiratory system. If workmen are protected against these contacts they do not have occupational diseases.

On the other hand, tuberculosis is a disease of bacterial origin. It results primarily from contact with those who have it and secondarily, from conditions that lower resistance to the infection. These conditions are not necessarily found in the plants. In fact they are more likely to be found outside.

Industry can act as a case-finding agency, it can protect workmen against contact with open cases within the plants, and it can safeguard workmen against conditions of employment that might accelerate minimal lesions or aggravate quiescent ones, but it cannot control outside causes even though the employee group is affected. So the over-all problem of tuberculosis control in industry is one of general community concern. It cannot be segregated within industry.

So far as industry itself is concerned, the sound long range program is to clear the plants of tuberculosis and to keep them clear. This does not necessarily imply that all workmen who have tuberculosis are unemployable. It does mean, however, that they must be employed only under conditions that permit them to work in safety to themselves and their fellow employees and they must have close medical supervision.

This does not require any fundamental changes in industrial medical procedure. Organized, as it is, to prevent occupational diseases and to maintain health, modern industrial medicine is prepared for the control of other diseases that affect or are affected by employment, and tuberculosis of course falls in this group.

With this as an introduction, industry's health maintenance program will now be discussed and wherever appropriate, special

consideration will be given to its influence upon the control of tuberculosis.

Health Maintenance Program

1 The object is to give employees the best possible health protection consistent with (a) the purpose of industry, (b) the employer's responsibilities as fixed by law, and (c) the rights of the physicians who are the employees' personal medical advisers.

The purpose of industry is manufacturing. To justify itself, medical service must assist in this purpose. It does so by holding down time lost by illness and injury to the lowest possible level, but it must do so in conformance with the employer's obligations as fixed by law and without interference with the rights of physicians in private practice. As the diseases and injuries of occupational origin account for less than one day of lost time for each employee per year, as compared with 9 days from non-occupational injuries and sickness, it is strikingly evident that the private practitioners are an important factor in employee health. They must be given the consideration that is due them.

A Procedures for Control of Sources of Disease in the Plant

2 The doctor is the health officer of the plant. It is his duty to locate, identify and determine the importance of all occupational and environmental sources of disease or health impairment and to see that they are corrected.

For the purpose of brevity, all industrial causes of disease are termed "exposures." They may be found in working conditions or environments, processes, operations or methods, substances or materials. They are usually in the form of dusts, fumes, mists, vapors, gases, or fluids, but may be found in various circumstances and conditions in the plant.

Location and Identification of Exposures
The first step toward control is to locate the spots that might be harmful and determine the nature of the effects to be expected from them. This is important because it develops information which is useful to the doctor when he examines the workmen later on, or when they consult him.

Exposures can be located by (a) tracing back sickness that occurs, but this is an expensive and unscientific method. It is much better for the doctor to (b) study the materials used in manufacturing, and if any are recognized as possible sources of disease, the operations or processes in which they are used are immediately identified as exposures.

Doubtless, most of the conditions capable of causing sickness can be located in this way, but a harmless substance may become harmful under certain conditions of usage. It is therefore necessary that the doctor (c) study the methods of manufacture, checking against conclusions drawn from the materials and looking for additional sources of disease in (d) general plant conditions.

For the purpose of orderly procedure, the doctor should describe all exposures, locate them and specify the number of men employed in each. In other words, he takes inventory.

Methods for Determining Importance of Exposures Having located and noted the nature of exposures, it is the duty of the doctor to determine the probability of their causing sickness. It may be possible for him to reach obvious conclusions merely by (a) cursory observations. If harmful dusts, fumes, mists, vapors and gases are noticeable, the assumption is that they are not under control.

If the doctor has any doubt, or if he desires confirmation, it is well that he arrange for (b) engineering studies, consisting of dust counts or chemical analyses of the air at the breathing level of the workmen. These will indicate the extent of exposure and may become useful as factual evidence.

Some industrial establishments employ hygiene engineers to supplement the observations of the doctor. If control of dust and other air contaminants is important, the employment of one is justified. A local engineer has the advantage of being able to check and recheck until complete control is effected.

Control of Exposures Having located and identified conditions that are capable of causing disease and either estimated or determined their importance, it becomes the doctor's duty to set the machinery of control in motion. How he does this depends upon his place in the organization. It is usually desirable that he consult with the safety en-

gineer, who is often much interested and frequently quite competent in recognizing conditions that are capable of causing disease and advising methods or designing apparatus for their control. Occasionally the safety engineer is completely responsible for the removal of dust and other air contaminants along with accident prevention. At any rate, he is thoroughly familiar with plant conditions and can be a valuable aid to the physician in the furtherance of his program for the prevention of disease.

The measures ordinarily used for control are (a) substitution of harmless materials when possible, or (b) changes in processing and manufacturing, (c) capture of dusts, fumes, mists, vapors and gases at their points of origin, (d) segregation of operations when capture is not feasible, (e) respiratory protection when safe limits of air contamination are necessarily exceeded, and (f) if there be dermal contact, by use of protective creams or suitable gloves, clothing, etc.

Maintenance of Control As exhaust systems, respirators, helmets and other protective equipment may get out of order, and plant conditions and operating methods may be changed, it is necessary that a plan for the prevention of disease include procedures to assure continued control over exposures. Obviously the first essential is intelligent use of the protective equipment. The workmen must receive suitable (a) instruction and have (b) watchful supervision. The latter is necessary to continuous effective operation of protective equipment as well as the maintenance of safe practices.

Early in the promotion of a control program it is desirable that the doctor, accompanied by the safety engineer or whoever may be responsible, make frequent (c) periodic plant inspections. Later, when routine is established the workmen are well informed in safe practices and the supervision is habitually watchful, inspections may be made with less frequency—say monthly.

As materials may be changed and processes modified it is important that the doctor make (d) studies of all materials purchased and (e) studies of all new processes or modifications of old ones, preferably before installations are made or changes are effected.

Superficially considered, the prevention of

diseases has the appearance of being complicated, and to management, expensive and impractical. The above procedure serves to simplify the problem and enables the doctor to place before management an understandable analysis furnishing means for estimating cost and planning for appropriate control measures.

Many conditions capable of causing disease will be found to be under control, others on the border line, a few needing attention. A practical approach is to effect early control of those most needing attention and from them work down to those on the border line of control.

B Procedures for Control of Diseases in the Plant

3 The doctor is responsible for the detection of physical impairments and diseases among the workmen and the determination of their significance as actual or possible sources of disability.

a If they be of occupational origin, the doctor is responsible for treatment. He may, however, delegate treatment to an assistant or to a consultant according to his judgment.

b If they be of non-occupational origin, the doctor's responsibility is discharged when he has reported his findings to the workman involved.

The above provisions are in conformance with the employer's responsibility as fixed by law and the rights of the physicians who are the employees' medical advisers.

The doctor discharges his duty in detecting physical impairments and diseases through physical examinations of the workmen according to the following schedule.

Preemployment Examinations These should be sufficiently complete to enable the doctor to advise on the safe placement of new workmen. They will include such technical procedures (roentgenograms of the lungs, urinalyses, blood pressure readings, etc.) as the doctor considers essential to a fair conclusion.

Transfer Examinations Workmen being transferred from one department to another should receive such examinations as may be necessary to safe placement in the departments to which they are being transferred.

Periodical Examinations These are to

secure early diagnosis of preventable diseases and adjustments in occupation if such be necessary. They should be as complete as the doctor needs to make them, and they should be made as often as required to give the workmen health protection, but not less frequently than annually.

Reentrance Examinations These should be made after absence for illness or injury. They are to protect workmen against too early return to usual work or to effect changes in occupation if indicated. These need not be more extensive than in the judgment of the physician is required to safeguard the workman and the employer.

Requested Examinations These are such as any doctor might make for diagnosis and counsel. They should be sufficiently thorough to establish whether a workman is suffering from an occupational or a non-occupational condition.

At any time the doctor's findings may indicate the necessity of separation or transferral. This is always an important decision and the doctor should make sure of his ground, but having reached a conclusion, it should be accepted with due appreciation of his motive and judgment which are assumed to be impartial and wholly medical.

4 The doctor should be consulted frequently. When the doctor is established and has won the confidence of the employees, he will be consulted often for the relief of minor ailments and advice on sickness that may or may not be related to occupation. To maintain the confidence and respect that prompt employees to seek this help, the doctor should conduct his consultation with them as he would if he were in private practice and they were his private patients. This phase of plant practice is regarded by management as a good-will builder and it is valued accordingly. It rounds out the doctor's health maintenance program. It behooves him to foster it.

5 The doctor must not, however, infringe upon the rights of the family physician. He may give temporary treatment for an emergency or to enable a workman to finish a shift. He may treat injury or sickness that results from occupation. All else must be guided into the channels of ordinary medical practice.

It is not necessary for the plant doctor to

irritate the physicians of the community by encroaching upon their fields, if he does so in the belief that he is protecting the interests of the employer or in assuring the employee good service, he is all wrong. He may co-operate with outside doctors. He may do what he can to shorten the waiting period that always precedes consulting a physician. Beyond this he need not go, except insofar as industry is legally responsible.

6 The doctor should keep records of all physical examinations and consultations, reports on injuries and illness and such other information as might be necessary to claims purposes. Management is not particularly interested in the number of treatments a doctor gives daily or the number of bandages he puts on, unless they indicate something out in the plant that needs correction. Management wants a complete medical record of each employee from day of employment up to his separation in order that claims for compensation may be judged fairly. Certainly the doctor needs complete records if he is to advise workmen on the maintenance of their health.

Management naturally has no idea as to the cost or importance of ordinary sickness among workers nor the possible relations, if any, of occupation to ordinary sickness. It would be better if it had because compensation is gradually being extended and may some day cover all sickness. It is therefore suggested that medical records be such that studies can be made of ordinary sickness as well as occupational diseases and injuries. As a matter of fact, such studies are essential to a complete health program.

C Procedures for Control of Disabilities

7 It goes without saying that management wishes employees to receive good medical service in the treatment of occupational injuries and illness. The control of disabilities begins with the care of disabled workers. The sooner they are returned to work the better it is for them and their employer. So the desideratum in the treatment of occupational injuries and disease is to effect recovery in the shortest possible time consistent with good results.

The plant physician is a professional man. It is presumed that he has had sufficient

training and experience to have developed what is called judgment, and he is entitled to use it in the treatment of his patients. Details as to treatment need not therefore be considered. Even so the plant doctor is now less a surgeon than formerly and more a medical adviser. He will do well to support his opinions and decisions by recognized counsel when in doubt and in all important cases. What industry sincerely wants next to avoiding occupational injuries and diseases is competent handling when they occur. It is cheaper and results are better in the long run. So the plant doctor who tries to carry the whole load is rather unwise, regardless of his ability.

This is especially true in the handling of cases that require corrective treatments—physiotherapy, occupational therapy and rehabilitation. It is also true in the handling of the x-ray service in the plant, particularly with respect to the interpretation of chest films.

Efforts to reduce disabilities by corrective methods are very desirable and frequently quite satisfactory if the beneficiaries are given work suitable to their readjusted physical condition. This is an employment procedure and the principles governing safe placement are applicable. In an industrial tuberculosis control program, it ranks in importance with suppression of conditions that favor tuberculosis and case-finding.

Conclusion

A great deal has been said about tuberculosis in industry and frankly industry is suspected of being an important source of the disease. Whether this be true or not, and it is subject to question, industry is an excellent point of attack and is prepared to assist considerably in the general movement against tuberculosis.

As a matter of fact, the health maintenance program of industry, without any special effort directed toward tuberculosis, is effective in preventing that disease as well as the ordinary occupational diseases. That much has already been accomplished as suggested by experiences of the Metropolitan Life Insurance Company in its group of 17,700,000 industrial policy holders. The following is quoted from that company's Statistical Bulletin of January, 1938:

*Mortality From Tuberculosis Drops
5.5 Per Cent*

"Whatever may be transpiring throughout the general population of the United States, the long-time downward swing in the tuberculosis death rate is still going on among these millions of insured wage-earners and their families. The tuberculosis death rate for 1937 in the general population of the United States is not yet at hand, but provisional reports for 1936 indicate that there was perhaps a slight increase from the death rate in 1935, so that the decline to which we had become accustomed from year to year seemed to be at least temporarily arrested. Among the insured, on the other hand, the mortality from this disease continued to drop

in 1936 by 2.7 per cent below the 1935 figure, and the 1937 death rate (51.3 per 100,000) marks a further sizable drop of 5.5 per cent. Over a period of a quarter of a century, the decline in the death rate from tuberculosis has been greater among the industrial policyholders of the Metropolitan Life Insurance Company than in the general population of the country, and this holds true for both males and females, and for Negroes as well as for white persons. This means, in essence, that the very element of the population where the tuberculosis situation was formerly the most serious has benefitted most from the movement against tuberculosis."

So industry has moved along with the general anti-tuberculosis campaign and industry can be counted on to carry on

Modern Concepts of Artificial Pneumothorax in Pulmonary Tuberculosis*

M. J. FINE, M.D.**
Newark, New Jersey

COLLAPSING the lung in the treatment of tuberculosis was advised long before "collapse therapy" was used in the form of artificial pneumothorax. Over a century ago, James Carson wrote "It has long been my opinion that if ever this disease (tuberculosis) is to be cured, and it is an event of which I am by no means disposed in all cases to despair, it must be accomplished by mechanical means, or, in other words, by surgical operation." He further stated "The lung would by those means be reduced to a state of quiet collapse and the elastic fibres separated by ulcer would be brought in contact. The lung would, in consequence of the absorption of air contained between the two pleura, be again dilated to contiguity with the outer wall surface of the chest, and if the other lung were diseased, it might then be treated as the former had." In 1832, James Houghton reported marked improvement fol-

lowing a spontaneous pneumothorax in cases of advanced tuberculosis.

Treatment by introducing air into the pleural cavity was originally reported by Potaine, who in 1884 treated hydrothorax by aspiration of fluid and injection of air. In 1882, Folanini treated tuberculosis of the lungs with pneumothorax. The first bilateral collapse therapy was performed in 1912 by Ascoli. Although perhaps used earlier, not until 1916 did the value of collapsing the lungs in tuberculosis obtain recognition in this country. The writer was among the first in the United States to advocate pneumothorax therapy in early tuberculosis and also suggested partial or selective collapse.

Brauer has stated that collapse of the lung has two essential functions: (1) Mechanical and (2) Physiologic. Under *mechanical*, may be included augmentation of the existing tendency for lung shrinkage, the approximation of cavity walls and prevention of extension along lymphatic and bronchial channels. *Physiologic* action includes ische-

* Read before the Medical Staff of the Newark City Hospital, May 5, 1938.

** Director, Tuberculosis Division, Newark, N. J. Department of Health.

mia of the lung with concomitant passive hyperemia or diminished lymph circulation—resulting in limitation and demarcation of the pathologic lung tissue with proliferation of connective tissue

The general value of this form of treatment has been so widely recognized that its use in sanatoria has expanded in the United States from 2 per cent in 1917 to almost 80 per cent today. Throughout Europe, collapse therapy is more advanced and more widely used. Because of economic conditions, a patient is sent to the hospital for an initial pneumothorax and then to local refill clinics for subsequent treatment. He is usually permitted to continue his regular occupation.

The modern sanatorium is an institution where the patient is taught to take care of himself and to prevent infection to others. This should take but a short time. It serves, too, as a detention camp for careless patients, and for those whose sputa continue positive in spite of collapse therapy.

We no longer think that every case of tuberculosis requires sanatorium care. The tendency now is to use hospitals where surgical treatment can be given. Collapse therapy is a surgical procedure that can be administered in general, as well as special hospitals. Hudson County (N. J.) has recently completed a 500 bed hospital in its Medical Centre at Jersey City for the treatment of tuberculosis and Bellevue Hospital (New York City), has added 350 beds to this service. It is well-recognized that after successful collapse has been established, the patient can be rendered non-infectious to his family because the sputum has become negative and the source of expectoration has been diminished.

In Newark, New Jersey, at both the Health Department and the City Hospital, we advocate pneumothorax in every case as soon as active pulmonary disease is diagnosed—disregarding the extent of the lung infection. Little contraindication to pneumothorax exists in the average case.

In the past five years at the Health Department Clinic we did

Refills	3310
No patients	269
No Initial-City Hospital ..	114

Pneumothorax is most effective between the ages of 10 and 45. After the age of 45, the pleura are less retentive of air and chances for a spontaneous pneumothorax with subcutaneous emphysema are greater. My youngest patient was one year old, my oldest 70 years of age. Pneumothorax can be given when only 10 per cent of the lung is normal, without producing a feeling of great discomfort. The only way to determine whether or not pneumothorax can be given, is to try it. Adhesions cannot be definitely recognized by physical or x-ray examination. The appearance of fluid during the pneumothorax is a more or less natural sequence. This fluid is usually absorbed readily and seldom becomes purulent, though in the pressure of tuberculous infection of the pleura, tuberculous empyema frequently follows.

Pneumothorax should be continued at least a year. Beyond that, its continuance depends on the patient's condition, involvement and response. My practice is, after a year, to permit the lung to expand gradually. When about a tenth of the lung is collapsed and I see that the cavity is closed and does not open, and the sputum negative, I then discontinue pneumothorax.

The patient enjoys a better chance of being able to carry on at his job when his lung is collapsed. My experience is that after the patient has had a successful collapse and the cavity has been closed (usually three or four weeks after initial collapse) he is then safely able to continue his occupation.

Tuberculous patients should not become pregnant while receiving treatment. Pregnancy, if it does occur, should be interrupted as soon as it is recognized, if before the fourth month. After the fourth month, the pregnancy should be permitted to go on to termination. If after delivery, the patient becomes worse, pneumoperitoneum should be instituted.

Although Ascoli gave bilateral pneumothorax in 1912, bilateral involvement was considered a contra-indication to pneumothorax until a few years ago. At present, from 10 to 15 per cent of all patients under pneumothorax treatment are receiving it bilaterally. In our Health Department Pneumothorax Clinic, twelve patients are now receiv-

ing bilateral pneumothorax In my private practice almost 50 per cent of my cases receive bilateral pneumothorax

Pneumothorax seems certain to remain a

valuable aid in the treatment of tuberculosis and it is here to stay until something more effective can be found

65 Gerard Place

Organization News

Report of the Committee for the Advancement of Scientific Programs on Diseases of the Chest

IN ENDEAVORING to formulate a report of the

Committee for the Advancement of Scientific Programs on Diseases of the Chest, it is strikingly apparent that the work of this committee and the one for the Advancement of Tuberculosis Organization in Medicine is so closely interlocked that it has been found practically an impossibility to segregate, as it were, the wheat from the chaff In considering the cause for this situation, I feel it is due to the fact that each state has a Governor who heads the work on both the Organization program and the presentation of Scientific Papers—so that in reporting the activities and progress of their respective States, the Governors, almost without exception, have given a combined report and in such a manner that, as I have stated, it has been practically impossible to segregate the activities of these two committees

It may appear that this committee has gotten away to a slow start However, this is only apparent, and not real, because the activities of this committee depend upon and follow the action of the Organization Committee After the Organization Committee has completed its work, which is over 50 per cent finished, the Scientific Program Committee will continue to follow up and remain a most important, permanent committee, whereas the Organization Committee will disband after the organization work is completed

The work of the Governors should continue as heretofore, that their activities should be reported to the Committee Member to whom their territory has been assigned, that the Committee members, in turn, should render their reports to the Chairman The Chairman will then send copies of the reports received from his committee members to the President of the College, the Chairman of the Board of Regents and the Executive Secretary of the College for their files

Now, referring to the brief report which I have been able to compile on the activities of this Committee, exclusive of the Organization Committee

Dr H G Trimble of California reports that the work on Scientific Programs is rather well covered by the California Tuberculosis Association, acting as the Tuberculosis Committee for the State Medical Society Since Dr Trimble's report we have received word that through the efforts of Dr Wm C Voorsanger this has been changed and that the Council of the California State Medical Society has now appointed a Committee on Tuberculosis, which is carrying on this work A series of clinics and talks in connection with the local medical society are arranged in each county every year, outside of the larger centers, where the local tuberculosis association carries on this work

Dr James S Edlin of New York reported in January the formation of a clinical society at the Municipal Sanatorium in Otisville, N Y, at which papers on tuberculosis were to be presented Dr Edlin, himself, has submitted papers for publication in *Diseases of the Chest*

From Michigan, a report was received from Dr John Alexander that a considerable number of papers are given each year before city, county and state medical societies The Trudeau Society meets twice a year, with meetings well attended The Department of Postgraduate Education of the University and of Wayne University carry on an itinerant postgraduate course each year as part of the program being specifically devoted to thoracic diseases

Dr Wm D Tewksbury of Washington, D C, has requested all Governors in the States assigned to him to cooperate in getting scientific papers on diseases of the chest on the local medical society programs He reported a Round Table discussion on chronic bronchitis and bronchiectasis in January before the District of Columbia Medical Society, over which he presided as Chairman Dr E R Fenton, a Fellow of the College, presented one of the papers

The Governor of Montana, Dr Frank I Terrill, has given talks before practically every medical society in the State He reports that the State

Sanatorium staff renders free service to physicians of the state through interpretation of questionable x-rays

Dr Marr Bisailon, Governor of Oregon, reports that last December an exhibit on tuberculosis and its control was given under the auspices of the Tuberculosis Committee of the State Medical Society. The agencies participating were the County Medical Society, the City Board of Health, the Oregon Tuberculosis Association, the Multnomah County Health Unit and the Visiting Nurse Association.

From my own State of Ohio, I am happy to report a generalized discussion of Tuberculosis therapy before the Muncie, Indiana Medical Society, the presentation of Planography (Body Section Radiography) before staffs of the Good Samaritan Hospital and Miami Valley Hospital

in Dayton, opening the discussion and showing of films before the Radiological Society of America in Pittsburgh, Pennsylvania, on December first.

The reports received from other states, I believe, are incorporated in Dr Matson's report and I feel that it would be only a repetition to enumerate them here.

All in all, I feel that the members of this Committee have accomplished splendid results in holding clinics and furthering the presentation of scientific papers on diseases of the chest.

W C BREIDENBACH, M.D.,
Dayton, Ohio,
Vice-Chairman,

Committee for the Advancement of Scientific
Programs on Diseases of the Chest

CORRECTION

In the April issue on pages 122 and 124 a report was incorrectly made of Oregon's new hospital. The name of the hospital is the University State Tuberculosis Hospital and Dr Ralph Matson is the Chief Surgeon and Chief Medical Consultant, not the Medical Director. Dr Matson's First Assistant, who is also Assistant Medical Director, is Dr John W Stacey of Yuma, Arizona, a Fellow of the College, the Second Assistant and Resident Physician is Dr James S Conant, a Fellow of the College, and the Assistant Resident Physician is Dr Florence A Brown, formerly of Auberry, California.

FELLOWS ON PROGRAM OF TEXAS TUBERCULOSIS ASSOCIATION MEETING

At the Thirty-first Annual Meeting of the Texas Tuberculosis Association held on April 11-13, 1940, at the Nueces Hotel, Corpus Christi, the Pioneers of the Texas Tuberculosis Association were presented. These included the following Fellows of the College: Dr W M Brumby, Houston, who organized the Association in 1908, Dr R B Homan, Sr, El Paso, who has served as a member of the Board of Directors, and in other capacities, for over 22 years, and Dr J B McKnight, Sanatorium, who has been on the Board of Directors since 1918.

FELLOWS SPEAK BEFORE MEETING OF ILLINOIS TUBERCULOSIS ASSOCIATION

At the Annual Meeting of the Illinois Tuberculosis Association, held at La Salle, April 15-16, 1940, Dr Robinson Bosworth, East St. Louis, Fellow of the College, spoke on *Present Sanatorium Laws—Their Advantages and Disadvantages*, Dr W J Bryan, Rockford, Fellow of the College, spoke on *Problems Facing Sanatorium Boards*, and Dr Bernard Klein, Joliet, Fellow of the College, spoke on *Pneumothorax Evaluations*. Dr Fred M Melxner, Peoria, Regent of the College for District Number 6, Presided over the Section on Diagnostic and Treatment Methods and was elected vice-president of the Illinois Tuberculosis Association.

In the Medical Sections, Dr Donato G Alarcon, Fellow of the College from Mexico City, spoke on *Results and Further Possibilities of New Treatment of Pulmonary Tuberculosis*. Also present as speakers, were Dr Orville E Egbert, El Paso, Governor of the College for Texas, *Problems in Tuberculosis of Long Standing*, Dr H F Carman, Dallas, Regent of the College for Texas, *Re-employment of Ex-patients*, Dr R G McCorkle, San Antonio, Fellow of the College, *Management of Pulmonary Tuberculosis in Relation to Hemorrhage*, Dr Sim Hulsey, Ft Worth, Fellow of the College, *Management of Pulmonary Tuberculosis in Relation to Allergic Diseases*, and Dr W C Farmer, San Antonio, Fellow of the College, X-Ray Conference.

PRESIDENT GIVES ADDRESSES

On April 3, 1940, Dr Ralph Matson, Portland, Oregon, President of the American College of Chest Physicians, spoke before the Oregon State Tuberculosis Association on *Modern Trends in the Surgical Treatment of Pulmonary Tuberculosis*. On April 5, 1940, Dr Matson also gave a Surgical Clinic for the Pacific Coast Surgical Society at the University State Tuberculosis Hospital.

GOVERNOR DELIVERS TALKS

Dr U E Zambarano, Governor of the College for Rhode Island, addressed the Rhode Island Tuberculosis Association on *Trends in Tuberculosis Work* on April 11, 1940. Dr Zambarano will address the Nurses of the Rhode Island Health Department on May 3, 1940 and the subject of his talk will be *The Treatment of Tuberculosis*.

YOUR HEADQUARTERS

JUNE 8, 9, 10, 1940 Meeting



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Foster Murray, M.D., Chairman,
Brooklyn, N Y

Surgical Section

David Ulmar, M.D., Chairman,
New York, N Y

Clinical Section

Edward P Eglee, M.D., Chairman,
New York, N Y

Entertainment Committee

James S Edlin, M.D., Chairman,
New York, N Y

General Arrangements Committee

Edgar Mayer, M.D., Chairman,
New York, N Y

12 00 P M—"INFORMATION PLEASE"
LUNCHEON

The men listed here are the experts who will sit at the head table and answer questions. Please address your inquiries to Dr Edward P Eglee, Chairman, 105 East 53rd Street, New York, N Y

Medicine

Dr James Alexander Miller
New York, New York

Surgery

Dr Ralph C Matson
Portland, Oregon

Bacteriology

Dr S A Petroff
Staten Island, New York

Physiology

Dr Dennison Richards
New York, New York

Bronchoscopy

Dr John D Kernan
New York, New York

X-Ray

Dr Maurice McPhedran
Philadelphia, Pennsylvania

Pathology

Dr Henry C Sweany
Chicago, Illinois

Saturday, June 8, 1940

9 00 A. M.—MEDICAL SECTION

Dr Foster Murray, Brooklyn, N Y, Chairman

"Chronic Pulmonary Diseases from the Insurance Point of View"

Dr Walter C Hausheer
Newark, New Jersey

Discussion to be opened by

Dr Harry Wessler, New York, New York

"The Indications of Voluntarily Discontinuing Pneumothorax Treatment"

Dr John N Hayes
Saranac Lake, N Y

Discussion to be opened by

Dr Paul H Ringer, Asheville, North Carolina

"Case Finding—A Fundamental in Tuberculosis Control"

Dr Herbert R Edwards
New York, N Y

Discussion to be opened by

Dr Frank Walton Burge, Philadelphia, Penn

"Extrapleural Pneumothorax A Report of Experiences and Present Day Indications"

Dr Richard H Overholt
Boston, Massachusetts

Discussion to be opened by

Dr Paul Geary, Plainfield, New Jersey

2 00 P M.—MEDICAL SECTION

"The Correlation Between Tomographic Studies of the Lung and the Necropsy Findings, Both Studies Done Shortly After Death"

Dr Israel G Epstein

Dr Myron Herman

Dr Henry Green

Brooklyn, N Y

Discussion to be opened by

Dr Abraham V Shapiro, New York, New York

"Newer Aspects of the Pneumoperitoneum Treatment of Pulmonary Tuberculosis"

Dr Andrew L Banyai

Wauwatosa, Wisconsin

Discussion to be opened by

Dr Burgess Gordon, Philadelphia, Penn

"Diagnosis of Bronchopleural Fistula in Tuberculous Empyema"

Dr D Matsuzawa

Staten Island, New York

Discussion to be opened by

Dr H McLeod Riggins, New York, New York

"Bronchoscopy in Bronchial Obstruction"

Dr Louis H Clerf

Philadelphia, Pennsylvania

Discussion to be opened by

Dr Mervin Meyerson, New York, New York

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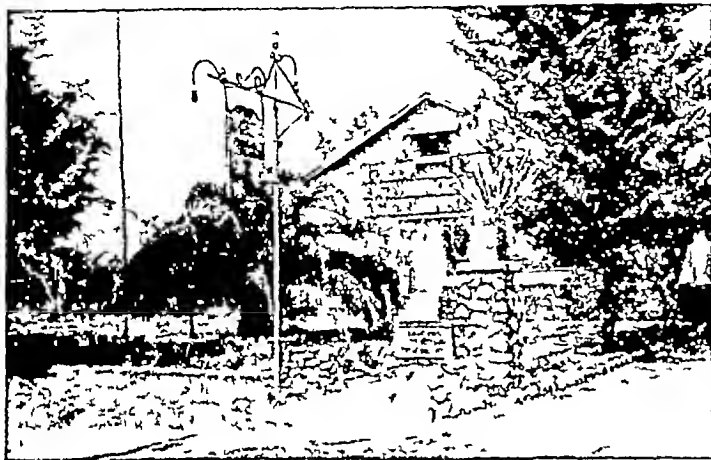
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7 00 P M—DINNER MEETING OF THE BOARD
OF REGENTS AND THE HOUSE OF
GOVERNORS

Sunday, June 9, 1940

9 30 A M—ADMINISTRATIVE SESSION

Presidential Address

Dr Ralph C Matson
Portland, Oregon

Reports of Committees

Committee for the Advancement of
Undergraduate Teaching in Medical Schools
Dr Edward W Hayes
Monrovia, California

Committee for the Advancement of
Tuberculosis Organization in Medicine
Dr Benjamin Goldberg
Chicago, Illinois

Sanatorium Committee
Dr Harry Warren
San Francisco, California

Committee for the Advancement of Scientific
Programs in Organized Medicine
Dr Champ H Holmes
Atlanta, Georgia

Statistical Committee
Dr J Winthrop Peabody
Washington, D C

Membership Committee
Dr Arnold Minnig
Denver, Colorado

Committee on Nominations
Dr John H Peck
Oakdale, Iowa

Report of the Secretary-Treasurer

Dr Robert B Homan, Jr
El Paso, Texas

Election of Officers

Address of Incoming President

Dr John H Peck
Oakdale, Iowa

12 00 P M—"INFORMATION PLEASE"
LUNCHEON

The men listed here are the experts who will
sit at the head table and answer questions Please
address your inquiries to Dr Edward P Eglee,
Chairman, 105 East 53rd Street, New York, N Y

Medicine

Dr Carl R Howson
Los Angeles, California

Surgery

Dr Richard Overholt
Boston, Massachusetts

Bacteriology

Dr S A Petroff
Staten Island, New York

Physiology

Dr Andre Cournand
New York, New York

Bronchoscopy

Dr Mervin C Myerson
Brooklyn, New York

X-Ray

Dr H L Sampson
Saranac Lake, New York

Pathology

Dr Henry C Sweany
Chicago, Illinois

2 00 P M—SURGICAL SECTION

Dr David Ulmar, Chairman
New York, N Y

"Surgical Management of Carcinoma of the
Lung"

Dr William F Reinhoff, Jr
Baltimore, Maryland

"Certain Aspects of Intrapulmonary Cavitation"

Dr Harold Brunn
Dr Sidney Shipman
San Francisco, California

"Surgical Treatment of Acute Pulmonary Abscess"

Dr Harold Neuhof
New York, N Y

"Surgical Treatment of Mixed Infection, Tubercu-
lous Empyema"

Dr Louis R Davidson
New York, N Y

All discussions will come from the floor

7 00 P M—COCKTAILS

8 00 P M—BANQUET AND INSTALLATION
OF OFFICERS

Monday, June 10, 1940

SYMPOSIUM ON TUBERCULOSIS

To be presented in the Section on Practice of
Medicine in the General Assembly of the Meet-
ing of the American Medical Association

"Epidemiology"

Dr Jay Arthur Myers
Minneapolis, Minnesota
Discussion to be opened by
Dr H S Diehl, Minneapolis, Minnesota

"Diagnosis"

Dr Hugh M. Kinghorn
Saranac Lake, New York
Discussion to be opened by
Dr Louis Hamman, Baltimore, Maryland

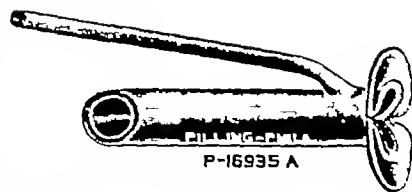
"Treatment"

Dr Ralph C Matson
Portland, Oregon
Discussion to be opened by
Dr Alexis Foerster, Colorado Springs, Colo

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Dr Julius Lane Wilson, New Orleans, Regent of the College for District Number 8 *Coordination of Anti-tuberculosis Activities*

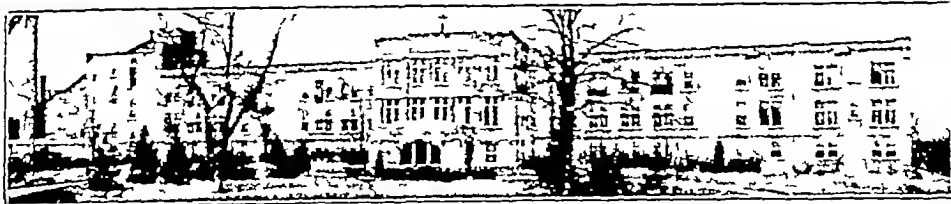
Dr Richard W Young, Baton Rouge, Fellow of the College *Early Collapse in Pulmonary Tuberculosis*

Dr Peachy R Gilmer, Shreveport, Fellow of the College, *Surgery in the Treatment of Tuberculosis*, which paper was discussed by Dr R H

Frost of Monroe, another Fellow of the College
Dr Louis A Monte, New Orleans, Governor of the College for Louisiana, Presided over the Section on Medicine and Allied Branches and discussed Dr Young's paper

TUBERCULOSIS CONGRESS

From October 13 to October 17, the Fifth Pan-American Congress on Tuberculosis will be held in Buenos Aires and Cordoba, Argentina. Dr Gumersindo Sayago of Cordoba will act as president and the official discussion subjects will be evidences of tubercularization of the South American countries, heredity and contagion in tuberculosis and the pulmonary aspects of the extrathoracic forms of the disease



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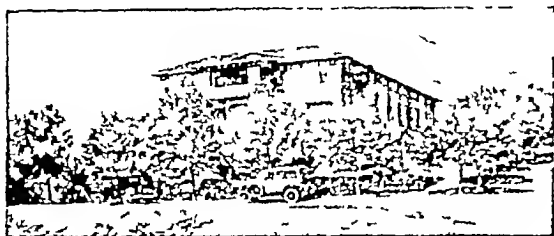
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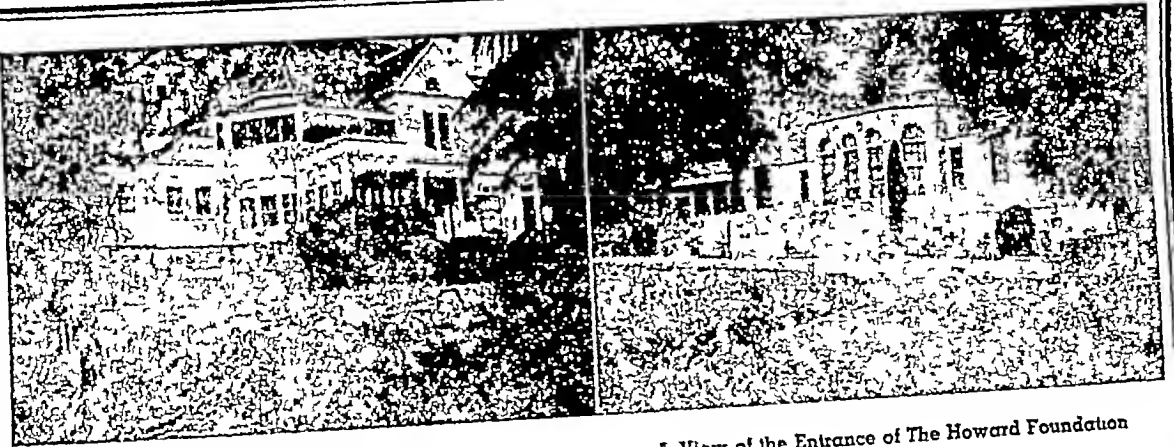
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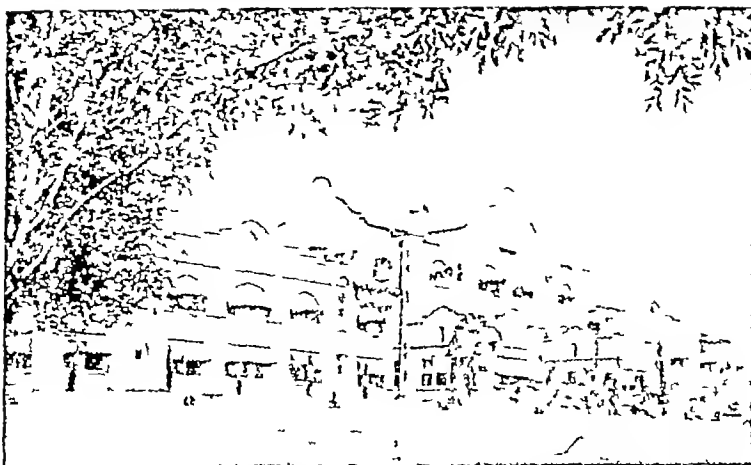
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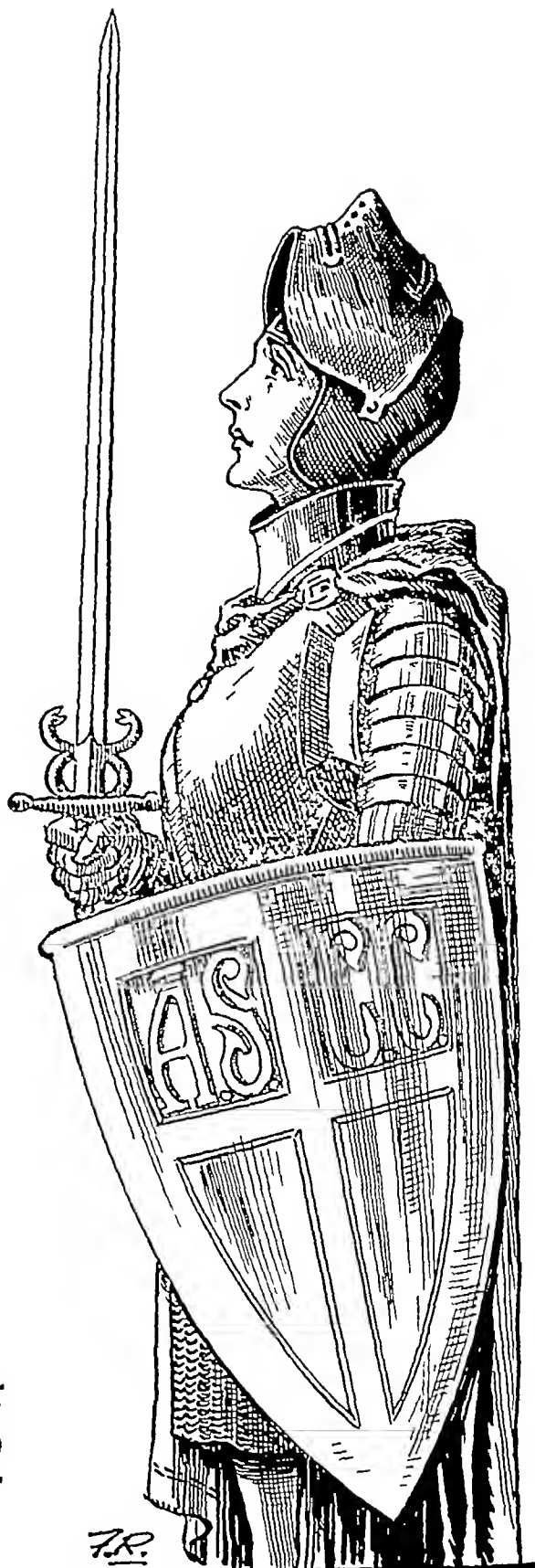
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Editorial Comment

Clean Food Food containers and wrappers may be conveyers of tuberculosis, typhoid fever, or other pestilential disease

When one knows that the bakers in his town are required to pass a careful medical examination and knows that the bread is wrapped in the bakery, he has a comfortable feeling that his bread is arriving free from infectious contamination. He does not stop to think of the possibility of a spray of tubercle bacilli, from the lungs of the printer who printed the wrapper, having contaminated the paper before it was applied to the loaf. The same idea applies to every kind of container used for foods which do not require cooking.

Those planning tuberculosis surveys might do well to keep in mind those industries which produce the material for food containers, or those which fashion the material into finished bags or other food receptacles or packages, and direct especial effort toward case finding in such industries' personnel.

The sanitary rooms of such factories should

receive particular attention from the inspectors of health departments and effort might well be expended in an endeavor to secure the co-operation of company officials in requiring hand washing by employees before leaving these rooms.

Some communities have discontinued examination of food handlers because of difficulty in securing proper examination, "racketing" of examinations, and various other reasons. This "defeatist" attitude, as Col Arthur Parker Hitchens typifies it, is as illogical as the abandonment of any necessary function that is difficult to perform, because it requires no effort to do nothing.

If "half a loaf is better than none," half clean bread is better than no clean bread and if half our infectious food handlers are eliminated through health examinations, we will only get half as much infection as if none were eliminated.

Let's keep on using our influence to secure as healthy food handlers as possible and start thinking about food containers, too.

F W B

Blood Groups In Hemoptysis A V Bernardo and F Medina of the Quezon Institute, Manila, P I, have made some very interesting studies of blood groups in their relation to pulmonary hemorrhage. They found in using 702 normal Filipinos as controls that the percentage of blood group distribution was closely parallel to the group distribution in the 502 tuberculous Filipinos used in their studies. Of these 502 tuberculous individuals, 245 gave a history of hemoptysis.

In these 245 cases they found an incidence of 37 per hundred in group "O", 48 per cent in group "A-B", 51 per cent in group "A", and 63 per cent in group "B". The result of their studies led them to the following conclusions: First, that pulmonary tuberculosis probably does not have any predilection for a particular group, second, that there is a higher incidence of patients with a tendency toward hemoptysis belonging to group "B" than to any of the other blood groups, and third, expressed mathematically, these findings point out that a tuberculous patient, belonging to group "B" has 63 chances out of a hundred to develop hemoptysis, while if he belongs to group "O" he has only 37 chances out of a hundred.

As seen above, these striking findings point out that tuberculous persons in group "B" are more prone to hemoptysis than those in any of the other blood groups. They could find no obvious reason for this. They suggest that there may be a possibility that persons belonging to group "B" have in themselves an inherent degenerative vascular condition that makes them more susceptible to bleeding, or possibly to certain hemorrhagic diseases. To say the least, their study is intriguing, and we suggest that these studies be continued in our own institutions. C M H

In Defense Of Atlanta This defense of Atlanta is not concerned with the invading hosts of the Federal army, under the command of General Sherman, which once besieged and burned this fair Georgia city. It concerns the newly released statistics on the tuberculosis mortality rate. The figures of this recently compiled statistical survey reveal a marked rise in the mor-

tality rate in Atlanta for the year 1938 and the rather alarming rate of 122 deaths per hundred thousand is recorded as compared to the figure of 94 for the previous year, 1937.

An investigation to explain this rise discloses the fact that in previous years the deaths of Atlanta residents occurring in other and remote places have not been included. These deaths have been included in the last census and contribute about an additional seventy-five deaths to the total. The large and ever increasing Negro population in Atlanta is another cause for the high mortality rate from this disease. The Negroes, in addition to their well-known racial susceptibility or lowered resistance, represent a major portion of the under-privileged group, and it is in such groups that the ravages of tuberculosis are the greatest. Finally, it is to be mentioned that the relief aid has bogged down to a considerable extent, and many families have been reduced to a state of marked privation, if not to the ragged edges of a bare sustenance. The role that nourishing food, warm shelter and the reassuring pay envelope play in the prevention, cure and rehabilitation of tuberculosis is only too well known.

All the agencies in Atlanta are doing yeoman service and performing meritorious work. The public spirit is excellent. The recent dismal report from the statistical quarter should, therefore, be viewed with tolerance and understanding. C H H

The "Unknown" Lymphatic

Dr Brian C Thompson states in the August, 1939 edition of the *Tubercle*, "There is a particular lymph-node of the internal jugular chain, in what I have termed the mid-jugular group which I have observed on seven occasions to become the seat of acute isolated enlargement and caseation, in each case preceded by progressive tuberculosis in the lung apex of the same side. This lymph-node has been shown in the cadaver to drain the dome of the parietal pleura by an afferent lymphatic distinct from those which pass to the supraclavicular lymph-nodes (Rouviere, 1932). Clinical corroboration of a dissecting-room observation is here strikingly afforded."

We have seen three similar cases and in one of them have demonstrated adhesions at the apex through which the Mycobacterium tuberculosis is assumed to have passed from the lung to the cervical lymph gland. The knowledge of this little known afferent lymphatic and its gland is important in the understanding of apical tuberculosis and apical new growth with cervical involvement. The cervical swelling may be the first sign of the pulmonary disease

F W B

Another Torch To Bear

To listen to the patient's chronicle of his or her symptoms, to make a di-

agnosis and then to prescribe a form or course of treatment, is only a part of the multiple duties of the physician. It does not end—nor perhaps begin—there. Unfortunately, many doctors apparently think so. In addition to being a practicing physician, a scientist and a philosopher, the physician must be a leader, a humanitarian and a good citizen. This public servant should be a paragon of fine citizenship.

Recent years have seen the increasing demand for doctors as public speakers. So, another role is being added to the already heavily laden curriculum. The scientific assembly halls where physicians are meeting in increasing numbers and with increasing frequency, to exchange ideas of mutual interest, to propound new theories, to reveal fresh discoveries, afford an instance where the ability to speak in public is a great asset. After dinner speeches, short informal talks and the formal address, have become a part of the routine of medical conventions.

The doctor, today, is taking an increasingly prominent part in the education—particularly in matters medical—of the public. His voice is being carried over the ether waves (the radio, not the operating room) with greater frequency. In the medical education of the public, nothing is more effective than the presence, the voice, of the doctor. This has been so often, and so strikingly, shown in the tuberculin skin-testing surveys. Skepticism, ignorance and fear, in the magic presence of the doctor, give way to confidence, belief and co-operation.

Short talks or lectures on medical topics

over the radio, in the school room at parent-teacher associations, at church guilds before women auxiliary societies, etc., have become one of the greatest factors in the forward progression of the healing art. It is most gratifying to see the physicians awakening to this responsibility and, in augmenting numbers, taking their place upon the speaker's platform.

Colleagues, carry on apace. It is your duty. It is your privilege.

C H H

The New York Meeting

Every once in awhile something so far out of the ordinary comes along

that it outshines all that has been done before in the particular field. We feel that we can claim this distinction for the program arranged for the New York Meeting of the American College of Chest Physicians.

In the way of scientific eminence, complete coverage of the field of chest diseases, practicality and general interest, this program has never been surpassed for the topics with which it deals.

As is usually the case, this achievement rests on a foundation of trial and error and growing importance built by the men who labored with past programs. Yet, we feel that Dr. Ornstein, the Chairman of the Program Committee, and the other men who worked so closely and conscientiously with him are deserving of praise and support.

And while we know that praise was the least of the motivating factors behind these efforts, we also know that the support of the Fellowship of the College will not only be appreciated, but is expected.

We can support this fine program by having present at the New York Meeting a larger percentage of the Fellowship of the College than at any preceding assembly. Let's send in our reservations today!

C M H

The complete program of the Sixth Annual Meeting of the American College of Chest Physicians, to be held June 8-10, 1940, at the Biltmore Hotel, New York City, will be published in the May issue of DISEASES OF THE CHEST.

Survivorship Rate on Collapse Therapy Patients Discharged From Sanatoria*

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St Paul, Minnesota

In combatting tuberculosis, the success of eventual eradication is dependent upon the balanced and continuous interplay of three fundamental forces. These basic activities include (1) diagnosis of early cases, (2) adequate sanatorium care, and (3) medical and social after-care, including rehabilitation. Individual initiative and effort in one field will be fruitless unless supported by cooperative action and integration with the other two parts.

The sanatorium system of caring for the tuberculous is still in a state of development and transition. Of late, new methods of treatment, such as collapse therapy, have been added. Sanatorium care has been augmented by epidemiological investigation, the purpose of which is to discover new facts about the natural history of tuberculosis and, at the same time, to find new cases soon after occurrence so that early treatment may be given.

Early diagnosis campaigns are being waged relentlessly throughout the state and country, and rightly so. In some states sufficient sanatorium beds are available to hospitalize all known sufferers of the disease who are willing to take the "cure." This aspect of the fight against the disease shows real accomplishment.

The third link in the chain, after-care and rehabilitation, seems to be the weakest one. It is, however, encouraging to note that during the past few years considerable interest has been aroused in the post-sanatorium mortality of tuberculosis patients. In order to plan wisely for after-care and rehabilitation, accurate statistics must be made available as to the scope of the work, the mortality and survivorship rates, the effects of collapse therapy, and a multitude of other factors involving the discharged patient.

As Frost¹ once stated, mortality experience is the only reasonably accurate measure of the effect of tuberculosis upon a community. Even mortality rates have deficiencies because only a limited number of deaths upon which the rates are based are reported by sanatoria or hospitals. Morbidity rates based upon reports of new cases have too many obvious sources of error to be used as measures of the effectiveness of tuberculosis control. Therefore, when mortality and morbidity data are combined to form a ratio of deaths to new cases, the inherent weaknesses of both statistics become accentuated. This ratio should not be termed the case-fatality rate because only new cases are included in the formation of this ratio, instead of all known cases, which is the procedure commonly used in good statistical practice. In addition, only a small portion of the deaths occurring during the year are among new cases reported that year (excluding those first reported by death certificate only), so such a "new-case fatality" rate is not a valid measure of the annual mortality experience of known cases exposed to the risk of dying.

The annual "new-case fatality" rate of the community is not a measure of sanatorium care because too many uncontrollable variables are at work and have not been measured and evaluated. To mention a few, there is the unsettled question of what a reportable case of tuberculosis is: first infection, reinfection, or both. There is a significant number of cases reported each year by death certificate only. There is a tendency to label a person as dying from tuberculosis, if a diagnosis of that disease has ever been made, regardless of the primary or terminal cause. This finding is born out by post-mortem statistics of patients dying in state institutions. There is evidence that with decreasing crude mortality rates from tuberculosis there has been a shifting of deaths from tuberculosis to the older age groups, where the age specific death rates are higher. The distribution of the general population shows a shift

* Presented before the Mississippi Valley Conference on Tuberculosis, St. Louis, Missouri, September 22, 1938.

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to the older age groups, with the result that more persons are exposed to the high risk of dying from tuberculosis, which is true of people of advanced age

The only impartial method of measuring the results of sanatorium care is to compare two groups of patients of similar age, sex, economic status, stage of disease, and type of collapse therapy, by means of life-table or case-survivorship methods of analysis for a period of not less than five years after the onset of disease or discharge from a sanatorium. One group must have had sanatorium care, the other, no sanatorium care. To find an untreated group with all the necessary data is a herculean task which apparently has not been performed.

In Minnesota's fairly stable population of 2,600,000 people, there has occurred in the last fifteen years a marked decline in the annual tuberculosis death rate per 100,000 persons from 69.5 in 1924 to 30.6 in 1938. What proportions of this decrease are assignable to early diagnosis, adequate sanatorium care (including collapse therapy), and post-sanatorium rehabilitation is difficult to determine because no common yardstick is available.

The fact that 90 per cent of the patients admitted to Minnesota sanatoria are received in the advanced stage of the disease is sufficient evidence that the early diagnosis aspect of tuberculosis control has not reached its potential highest level of efficiency and, accordingly, cannot be credited with the major part in the reduction of the tuberculosis death rate. The amount of money spent for follow-up and rehabilitation of discharged patients is small in this state, so the reason for the steady decrease in the tuberculosis death rate cannot entirely be found there.

In Minnesota there are fifteen sanatoria and nineteen state institutions with sufficient bed capacity to isolate all known cases of reinfection type tuberculosis wanting care. If for no other reason than because of the isolation provided infective tuberculous persons, it is reasonable to assume that sanatorium care has been a major factor in the decline of the death rate from tuberculosis. Statistically, however, in the light of present knowledge, that statement cannot be proved or disproved.

The purpose of this brief report is to pre-

sent a method of investigating the survival rates of discharged tuberculous patients, many of whom have been subjected to various forms of collapse therapy while in the sanatorium.

The role of collapse therapy in controlling tuberculosis is an interesting and vitally important subject. A distinction must be made between the immediate and the late results of chest surgery in the treatment of pulmonary tuberculosis. The chest surgeon is primarily interested in the post-operative results of his work, and the life experience of his patients while in the sanatorium. Today, the operative mortality from chest surgery performed by skillful hands has reached an amazingly low rate.

The public health administrator is primarily interested in the survivorship rates of these tuberculous patients with surgical collapse, during the immediate years after discharge from a sanatorium. In addition, he is concerned with what proportion of the total number of tuberculous patients can be benefited by judicious use of collapse therapy. Unless that number is appreciable, the death rate from tuberculosis in the community will not be affected, even though the value of miraculous cures in a few individual cases is unquestioned.

The records of 6,956 verified cases of reinfection type tuberculosis have been investigated, and form the basis of this study of patients discharged from Minnesota sanatoria from 1926 to 1935 inclusive. This group is a random sample of the total number of tuberculous patients discharged during that period.

Of the total patients discharged, 10 per cent were minimal, 28 per cent, moderately advanced, and 62 per cent, far advanced on admission. Only seven per cent of all cases discharged alive could not be traced at least one year.

It is interesting to note that 96 per cent of the minimal, 85 per cent of the moderately advanced, and 42 per cent of the far advanced (on admission) were discharged alive. What an opportunity of saving life tuberculosis specialists would have if the majority of cases entered a sanatorium in the early rather than in the advanced stage of the disease!

In Table I may be seen the distribution of

discharged patients by type of collapse therapy and by National Tuberculosis Association classification. Various combinations of collapse therapy have been used on these patients, including pneumothorax, phrenic operations, pneumolysis, oleothorax, scalenotomy, and thoracoplasty. However, in order to have reasonable numbers in each category for analysis, three groups were arbitrarily chosen: (1) pneumothorax alone, (2) some phrenic operation alone or in conjunction with pneumothorax, and (3) thoracoplasty cases of one, two, or three stages, with or without phrenic operations or pneumothorax prior to thoracoplasty.

TABLE 1

Distribution of Discharged Patients by Type of Surgery and NTA Class For Minnesota Sanatoria—1926 to 1935

		NTA Classification			
		Minimal	Mod	Far	Total
Total Discharged		696	1,914	4,346	6,956
<hr/>					
Discharged Alive	No	668	1,633	1,834	4,135
	%	96	85	42	59
Pneumothorax Alone	No	22	219	318	559
	%	3	14	17	14
Pneumothorax and Phrenic Operation	No	21	102	189	312
	%	3	6	10	8
Thoracoplasty alone or after other Surgery	No	4	49	202	255
	%	0.6	3	11	6
Some Surgery of above three types	No	47	370	709	1,126
	%	7	23	38	28
<hr/>					
Discharged Dead	No	28	281	2,512	2,821
	%	4	15	58	41
Pneumothorax alone	No	4	35	223	262
	%	14	12	9	9
Pneumothorax and Phrenic Operation	No	1	16	125	142
	%	4	6	5	5
Thoracoplasty alone or after other surgery	No	0	18	57	75
	%		6	2	3
Some Surgery of above three types	No	5	69	405	479
	%	18	24	16	17

From a practical point of view it is of more concern to determine what happens to all patients who have had some form of collapse therapy than to consider the late results of a group of selected ideal cases most likely to experience successful treatment.

This discussion is not an evaluation of the comparative results of various types of collapse therapy from a surgical point of view. It is a study of the mortality experience of a group of patients who have had collapse therapy while in the sanatorium. It does not include those patients who died in the sanatorium or in the immediate post-operative period. Accordingly, these figures must not be considered as post-operative mortality results of chest surgery.

It is to be remembered that patients on whom collapse therapy is attempted are often a selected group who would be most likely to benefit by such therapy. The mortality experience of such a group, even if collapse therapy were not attempted, should be better than the mortality experience of the general group of patients on whom collapse therapy cannot be done.

Two commonly expressed reasons as to why collapse therapy is not used in many cases of pulmonary tuberculosis are: (1) that many physicians doing tuberculosis work believe sincerely that conservative treatment, consisting of bed rest, good food, and hygienic surroundings, should be tried for a reasonable period before other therapy is attempted, (2) that because of extensive involvement of both lungs and the poor general condition of certain patients, no surgery should be attempted for fear of rapid spread of the disease.

From Table I it can be seen that the number of minimal cases discharged alive after receiving collapse therapy is too small to be used for follow-up study, so the discussion from this point on will be limited to the moderately and far advanced cases.

It is observed that of the 1,633 moderately advanced cases discharged alive, 14 per cent had pneumothorax, 6 per cent, phrenic operations and pneumothorax, and 3 per cent, thoracoplasty, or a total of 23 per cent of these patients discharged alive had one of the above three types of collapse therapy.

In the far advanced group of 1,834 cases

discharged alive, 17 per cent had pneumothorax alone, 10 per cent had phrenic operations plus pneumothorax, and 11 per cent had thoracoplasties done, making a total of 38 per cent of this group who had some of the above types of collapse therapy

It is pointed out that if the total number, rather than the number alive on discharge was considered, the percentage of persons receiving collapse therapy would be decreased. Careful distinction must be made between the number of patients upon whom collapse therapy is attempted and the number who live to benefit by it

Of the 281 moderately advanced cases dead on discharge, 12 per cent had pneumothorax, 6 per cent, phrenic operations and pneumothorax, and 6 per cent, thoracoplasty, or a total of 24 per cent

Of the 2,512 far advanced cases dead on discharge, 9 per cent had pneumothorax, 5 per cent, phrenic operations and pneumothorax, and only 2 per cent, thoracoplasty operations, or a total of 16 per cent had some one of the above types of collapse therapy

The method of study used in this investigation of collapse therapy cases is a modified form of life table analysis, described in the literature by Frost¹, Brieger², and, most recently, Puffer³. Consideration is given to the number of persons alive at the beginning of each year after discharge, the number withdrawn and dying during each year, and the average number of persons at risk each year, as seen in Table II, Column 3. By taking the number of cases dying each year as the numerator and the average at risk during the year as the denominator, it is possible to set up the probability of a group of sanatorium patients' dying in any successive year after discharge. By subtracting from 100 per cent the percentage of those who die, one obtains the percentage of those who survive.

Because of the fact that health workers are concerned only with those patients discharged alive who present problems of after-care and rehabilitation, it seems worth while to consider these cases on the basis of an annual case-survivorship, rather than case-fatality rate. For uniformity it is suggested that we adopt in all future studies the term "annual case-survivorship rate" to describe the mortality experience of patients discharged

from tuberculosis sanatoria. This rate is simple to understand and easy to use, and provides a useful yardstick for measuring mortality and survivorship experience.

By using the annual case-survivorship rate for the first year after discharge in conjunction with each annual case-survivorship rate for succeeding years after discharge, one may obtain the percentage of persons surviving through the past and present years as seen in Table II, Column 6. The number of persons who have been followed up should be large enough so that the rates established have statistical significance.

In making comparisons of annual case-survivorship rates for different groups of patients, many factors must be taken into consideration. It is known that the death rate from tuberculosis varies with age. The tuberculosis death rate is low in the period up to 15 years, jumps to a high level in the period 15 to 25 years, remains rather stationary up to 60 years of age, and thereafter increases in amount. The tuberculosis death rate varies with sex, especially in the young adult group. It is not fair to compare one set of cases comprised mostly of young individuals with another set composed mostly of older persons. Corrections should be made by one of the commonly used statistical techniques for differences in distributions, such as age and sex, before comparative analysis.

However, in the study presented which is only a preliminary report, the age groups and sexes have been thrown together in order to have enough cases to form reasonable rates. All comments regarding the annual case survivorship rates in this group of patients followed up in Minnesota must be qualified by uncorrected factors in the data, such as, sputum findings, extra-pulmonary complications, number and duration of residences, and reason for discharge.

Examination of Table II discloses the fact that during the fifth year after discharge 80 out of every 100 moderately advanced cases who had no surgery were still alive. In other words, a five-year case-survivorship rate of 80 per cent was established. The far advanced cases with no surgery showed a five-year case-survivorship rate of almost 50 per cent. These figures are not directly comparable because the two groups of cases rep-

resented have not been corrected for variable factors previously mentioned. However, it appears that, with such a large difference in the case-survivorship rates, it is unlikely correction factors would completely wipe out the significance of the findings. Some of the survivorship rates from English investigations⁴ for the first two decades in the twentieth century show only 50 per cent of the moderately advanced and 20 per cent of the far advanced alive five years after discharge.

It was observed that the five-year survivorship rate of moderately advanced cases who had pneumothorax alone was 88 per cent of those with phrenic operations with or without pneumothorax, 75 per cent, of those with thoracoplasty alone or in combination with other surgery, 77 per cent.

Among the far advanced cases who had pneumothorax alone, the five-year case survivorship rate was 77 per cent, in the cases with phrenic operations, with or without pneumothorax, 70 per cent, in the patients with thoracoplasty alone or in combination with other surgery, 74 per cent. These rates are all higher than the survivorship rate of 54 per cent for far advanced cases with no surgery. If further careful analysis bears out these findings, collapse therapy will have made definite strides in the control of the disease.

Statistical conclusions regarding the number of lives which have been saved and the number of cases arrested and rendered non-infective by means of collapse therapy cannot be given because the number of cases is not large enough to correct for important variables. Differences, however, do indicate that collapse therapy can make a real contribution in the reduction of tuberculosis mortality in patients after discharge when it is recalled from Table I that 23 per cent of the moderately advanced and 38 per cent of the far advanced patients discharged alive had the benefit of some of the above-mentioned types of collapse therapy.

Comments

As stated in a recent review⁴, the literature from 1885 up to the time of this study in 1926 has shown that a person with minimal tuberculosis had his risk of dying increased approximately four times, the moderately ad-

vanced, 16 times, and the far advanced, 40 times over that of persons in the general population from which these patients were drawn. Recent studies⁵, based on Minnesota data give evidence that in the period from 1926 to 1935 the minimal case's risk of dying was increased only twice, the moderately advanced, five times, and the far advanced, nine times over that of persons of similar age in the general population. Although these figures are not directly comparable with the ones of prior years, because of the lack of controlled variables, it is interesting to note that during the last decade the trend seems to be markedly downward.

The question may be raised as to whether or not it is early diagnosis and treatment that brings about the reduced risk or whether or not the reduced risk is inherent to the stage of the disease that exists at the time. It may be both.

Systematic follow-up after discharge, including provision for the necessities of life for tuberculous patients, could reduce the number of deaths and result in the prevention of the spread of tuberculous infection and disease to members of the patients' families. The need for universal provision of adequate medical supervision of discharged tuberculous patients is one of the greatest lessons learned from a careful perusal of figures on survivorship of discharged patients.

Data on the mortality or survivorship rates of discharged patients cannot be used as a yardstick to measure the results of sanatorium treatment. This can be done only by comparing two groups of tuberculous patients, one with and the other without sanatorium care. Annual case survivorship rates should prove invaluable as a sound foundation for the development of an after-care and rehabilitation program which would take into consideration the condition of the patient on discharge and his chance of surviving during the immediate period thereafter. A thorough knowledge of post-sanatorium mortality is a prerequisite of sound rehabilitation planning.

The sanatorium alone cannot solve the problem of the control of tuberculosis. If this costly, contagious disease is to be eradicated, there must be continuous bombardment along three fronts: (1) diagnosis of early cases, (2) adequate sanatorium care, and

TABLE II

Annual Case Survivorship Rate of Patients Discharged From Minnesota Sanatoria 1926-35

Year After Discharge	No Surgery						Pneumothorax Alone						Phrenic Operation With or Without Pneumothorax						Thoracoplasty Alone or in Combination With Other Surgery					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Moderately Advanced																								
0-1	1149	21	1138.5	54	95.3	95.3	210	6	207	9	95.7	95.7	99	4	97	7	92.8	92.8	48			3	93.7	93.7
1-2	1074	43	1052.5	55	94.8	90.3	195	8	191	6	96.9	92.7	88	8	84	2	97.6	90.6	45	3	43.5		100.0	93.7
2-3	976	93	929.5	38	95.9	86.6	181	29	166.5	2	98.8	91.6	78	25	65.5	3	95.4	8.64	42	6	39		100.0	93.7
3-4	845	111	789.5	22	97.2	84.2	150	32	134	1	99.3	91.0	50	13	43.5	3	93.1	80.4	36	8	32	1	96.9	90.8
4-5	712	97	663.5	24	96.4	81.2	117	30	102	1	99.0	90.1	34	11	28.5	2	93.0	74.8	27	6	24	1	95.8	87.0
5-6	591	81	550.5	11	98.0	80.0	86	23	74.5	2	97.3	87.7	21	9	16.5	0	100.0	74.8	20	6	17	2	88.2	76.7
Far Advanced																								
0-1	1027	26	1014	220	78.3	78.3	310	6	307	22	92.8	92.8	181	4	179	16	91.1	91.1	194	2	193	9	95.3	95.3
1-2	781	34	764	121	84.2	65.9	282	9	277.5	13	95.3	88.4	161	5	158.5	11	93.1	84.8	183	9	178.5	6	96.6	92.1
2-3	626	61	595.5	57	90.4	59.6	260	31	244.5	14	94.3	83.4	145	26	132	7	94.7	80.3	168	38	149	8	94.6	87.1
3-4	508	64	476	29	93.9	56.0	215	39	195.5	9	95.4	70.6	112	42	91	6	93.4	75.0	122	33	105.5	4	96.2	83.8
4-5	415	62	384	30	92.2	51.6	167	41	146.5	4	97.3	77.5	64	25	51.5	2	96.1	72.1	85	20	75	2	97.3	81.5
5-6	323	63	291.5	12	95.9	49.5	122	33	105.5	1	99.1	76.8	37	17	28.5	1	96.5	69.6	63	18	54	5	90.7	73.9

N T A Classification

1—Present at beginning of year
 2—Withdrawn during year
 3—Average at risk during year

4—Number dying during year
 5—Percentage surviving through year
 6—Percentage surviving through past and present years

DISEASES OF THE CHEST

1940

(3) medical and social after-care of tuberculous patients discharged from sanatoria

Summary

1 Post-sanatorium mortality statistics for patients discharged from Minnesota sanatoria during the years 1926 to 1935 are presented

2 The records of 6,956 verified cases of reinfection type tuberculosis form the basis of this preliminary study on the post-sanatorium experience of discharged tuberculous patients

3 Of the total patients discharged, 10 per cent were minimal, 28 per cent moderately advanced, and 62 per cent far advanced on admission

4 Of the total cases discharged, 96 per cent of the minimal, 85 per cent of the moderately advanced, and 42 per cent of the far advanced (on admission) were discharged alive

5 A modified form of life table analysis was used in studying the group of cases who did not have collapse therapy and the three groups who had collapse therapy, the moderately advanced cases who had no surgery had a five-year case survivorship rate of 80.0,

those with pneumothorax, 87.7, those with phrenic operations, 74.8, and those with thoracoplasty, 76.7. The far advanced cases who had no surgery had a five-year case survivorship rate of 49.5, those with pneumothorax, 76.8, those with phrenic operations, 69.6, and those with thoracoplasty, 73.9

6 Adequate sanatorium care must be provided for persons with reinfection type tuberculosis if they wish to arrest their disease and continue to live

7 There is urgent need for continuous medical and social after-care and rehabilitation of discharged patients in order to carry on the good work started in the sanatorium

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The Role of the General Practitioner in Pulmonary Tuberculosis

Diagnosis and Treatment*

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The backbone of the fight against tuberculosis is the family doctor. His is a much more important part than that of the specialist, not only for prevention and early diagnosis, but also for home treatment and after-care.

Three measures of direct attack are his:

1 Case-finding intensified to the highest possible degree

2 Isolation and treatment of open cases at the earliest possible moment

3 Surveillance of families in a continuous and systematic manner

In applying this program to the family there is implied extensive pulmonary examination and subsequent periodic check-ups for all its members.

Individuals can conveniently be grouped into three classes, those with

1 Tuberculous infection recognizable by the tuberculin test

2 Tuberculosis recognizable by radiographic examination only

3 Tuberculosis clinically manifest

For practical purposes, this enables us to distinguish between (a) normal families, that is, those with infection recognized by the tuberculin test, but with no lesions demonstrable by x-ray, (b) families with closed or unsuspected tuberculosis, recognizable by

* A continuation of Dr. Max Pinner's paper, published in the preceding issue. Read before the Bronx County Medical Society as part of a Symposium on the Role of the General Practitioner in Pulmonary Tuberculosis, November 15, 1939.

x-ray only, and (c) families with active or open lesions, clinically manifest

In the course of his *first periodic health examination* of the family members, the general doctor should find all cases of tuberculosis as well as suspects, should endeavor to obtain a complete history of tuberculosis in the antecedents, should obtain roentgen films of the chest of all adults and adolescents, should perform tuberculin tests on all members. As infection takes place commonly during childhood, the tuberculin test should be made routinely at definite intervals from infancy on. In short, the investigation should immediately reveal, not only all cases of tuberculosis including the open or momentarily closed ones (regardless of whether they are active or stationary and symptomless), but should also bring under scrutiny all cases suspected of harboring tuberculous lesions. Negative reactors to tuberculin are to be retested every year for determining the development of infection. A newly developed positive tuberculin test indicates recent infection and careful watching. Tuberculin reactors with negative x-rays should be re-x-rayed annually.

Families with open cases will naturally require not only immediate medical care, but also continued surveillance after arrest, to prevent their future re-opening as cases of phthisis. Continued exercise of measures to prevent reinfection of infected contacts, as well as to avoid exposure of young children is indicated. These objectives can be achieved only by carrying out a strict routine of isolating open cases until they close, by frequent periodic re-examination of the recovered patient, and frequent periodic clinical-roentgenological studies of other members of the family.

The intensity of these measures may relax in accordance with the incidence of manifest lesions or infection present.

By efficient pursuit of this program, effective control of tuberculosis in the family will accrue. The success of the campaign will be directly measurable by the elimination of unsuspected phthisis in members of the family. The success of the physician's preventive campaign will be determined by his ability to keep at a minimum the cases of tuberculous infection associated with clinical manifesta-

tions. He must prevent

1 Development of phthisis unexpectedly in an unsuspected member of the family

2 Development of clinically manifest primary infection, that is, infection capable of producing disease due to direct and massive exposure

The prevention of exacerbation of a tuberculous lesion, or even of the progression of infection to the stage of disease cannot, to be sure, be completely effected by the family physician. However, through his painstaking investigation, the physician should be immediately aware of all those harboring lesions of disease-potentiality, and if a case of phthisis does appear, it will not occur in one hitherto unsuspected.

Early Diagnosis

For the general practitioner the early diagnosis of pulmonary tuberculosis should not be difficult. Knowledge of certain facts helps make the diagnosis simpler. A *history* of known exposure to tuberculosis is valuable, although the absence of such history proves little. *Symptoms* and *physical signs* are usually absent at the start, or slight, until the disease is well advanced. Examination of the sputum does not usually reveal tubercle bacilli until the lesion is well advanced. We must seek tuberculosis among the apparently healthy people if we are to treat the disease most successfully. By the *tuberculin test* we can often detect tuberculosis within three weeks after the bacilli have entered the body and the primary complex has begun to develop. Fifty to seventy per cent of adults in rural districts may be free of this primary infection. In general, pulmonary tuberculosis is not the result of primary infection. Reinfection, on the contrary, appears to be the usual cause of tuberculosis, whether that reinfection comes from within or without. The primary infection in the child is resisted so well that, usually, it requires no treatment.

The most important means of early diagnosis is the *x-ray*. This, however, must be properly taken and properly interpreted, preferably by an experienced roentgenologist or tuberculosis expert. The x-ray shadows may exist even a few years before symptoms develop.

In the presence of abnormal x-ray shadows,

how shall we decide that they signify active tuberculosis? Even in the absence of symptoms, examination of any sputum whatsoever and of gastric contents is indicated for the finding of tubercle bacilli

A single x-ray may indicate that the lesion represents active tuberculosis, by the soft and hazy appearance of the shadow, with absence of clear-cut outline, by the obvious presence of caseous tuberculosis of enlarged tracheo-bronchial lymph nodes, and by the presence of an annular shadow representing cavity. But generally, serial x-rays, compared over a period of time, are needed to decide activity of the disease. Unchanging shadows over a period of about six months, in the absence of symptoms of clinical activity, indicate arrested disease. A widespread amount of disease, as shown by the x-ray, can exist without representing active tuberculosis, just as the smallest amount tucked away in an apex may represent a very active disease.

Abnormal physical signs may be conspicuously absent in active tuberculosis particularly in the early infiltrate. Except for the signs of a cavity, abnormal signs do not necessarily indicate active tuberculosis, but the development of physical signs in a new area on re-examination strongly suggests active tuberculosis. Rales are not uncommonly present in healed fibrotic disease. Early disease does not imply limited disease, especially in adolescence. Spread is often rapid, even to the extent of half a lung within a few weeks of onset.

Positive *sputum* is the ultimate test in the diagnosis of active tuberculosis and should be assiduously sought for by repeated study of stained smear of sputum, as well as by concentration methods, studies of cultures and guinea pig inoculations. Examination of the patient's saliva will often deceive us by supplying a negative return from the laboratory, but even the frightened patient who swallows the sputum may often be outwitted by an examination of gastric lavage, or, on rare occasion, even of the stools. Elevated *blood sedimentation* rate may point to active disease, although it is not necessarily elevated in all active cases, similarly so with a shift to the left in the *polynuclear index*, so that the young forms of polynuclear cells are abnormally increased.

Subjective evidences of activity, often over-search and questioning, such as elevation of temperature, rapid pulse, fatigue, rundown state, poor appetite, indigestion, loss of weight and pleurisy. The more obvious symptoms are cough, expectoration, manifest fever and blood-spitting. However, the absence of these symptoms does not preclude a diagnosis of active disease.

Hemoptysis does not necessarily indicate activity, as it may come from an obsolete lesion especially a bronchiectasis, but its presence always indicates a period of study and observation.

Newly Detected Minimal X-ray Lesions Without Manifest Symptoms

A most difficult problem, not only for the general doctor, but often for the specialist, is the proper management of the newly detected x-ray lesion, usually found in the upper third of the lung without accompanying symptoms. Proper diagnosis first is necessary, discriminating between those lesions that need treatment and those that do not. In the majority of persons, minimal upper lobe lesions without accompanying symptoms represent residual images of old tuberculous infections that are healed and need no treatment. In a certain proportion, they represent a so-called latent disease which possesses the potentiality of progression and requires treatment. The *obsolete residual images* are usually found in an adult and have characteristic x-ray features. In these images, the lesion is usually bilateral, multiple in distribution, apical or sub-apical in localization and appears nodular or string-like and partially or completely calcified. The *latent lesion* that requires treatment is not always easily distinguished from the obsolete, but its x-ray appearance is often as a single nodule in the upper third of the lung, or between the hilum and the clavicle, isolated and less distinct in outline, and suspiciously resembling the initial focus of chronic progressive pulmonary tuberculosis. It can be exudative, caseous or fibrotic, (it is rarely calcified). Its presenting sign may even be a pleurisy which is detected on the x-ray without obvious accompanying pleuritic symptoms. Latent disease may also appear as enlarged hilum lymph node tuber-

culosis, although caseous enlargement of such tracheo-bronchial nodes can be positively identified only when some part of their oval outline can be defined approaching the median lung field. The opinion of many roentgenologists that such tuberculosis of the tracheo-bronchial lymph nodes can be recognized by increased density of the shadow at the hilum, or by thickening of the mediastinal shadow, is in practice misleading.

Age and sex and recency of infection, especially in contacts, may strongly point the trend of these shadows. The younger the individual, especially with the adolescent female, and the more recent the infection, as evidenced by a history of recent exposure and especially by the presence of a newly developed tuberculin response, the less the likelihood of obsolescence. The progression of these x-ray shadows is more likely to take place in men beyond 20 years of age, but, before that in women. Racial predisposition, poverty, ignorance, malnutrition and employment in the unskilled and dusty trades may point the trend of progression of these lesions.

In contrast to these two forms of tuberculosis without symptoms is the *manifest active disease*, accompanied by symptoms which of course requires immediate treatment. This is usually of exudative nature, less commonly a productive disease, and located generally in the upper third of the lung, although no part is exempt. It appears either of considerable size at the start, or as groups of small nodules of productive tuberculosis which continue to progress and become confluent. Recent manifest exudative tuberculosis, especially in young women, can be most serious. It relates more to younger ages. There is a likelihood of its rapidly liquefying to cavity formation and spreading through the bronchi. Fibrotic and calcified lesions are of less serious significance, although it must be remembered that fresh calcifications may still contain caseous material and their breakdown occasionally occurs. The chronic fibrotic and less progressive disease relates more to middle life.

Treatment

In *obsolete healed lesions*, no difficulties are encountered in management. In *latent lesions*, suspected to be active, the difficulties

of management are encountered. Generally, the closest of continued observation and scrutiny are necessary until such time as the lesion is definitely recognized as obsolete. Postponement of treatment pending a period of observation is only justifiable when the lesion is definitely recognized to be stable and fibrosed. Where symptoms are lacking or vague, the pulmonary infiltration although small is potentially dangerous. In every case treatment should be prompt and strict and observation made at frequent intervals, at first with an x-ray and close clinical study every two to three weeks until the stability of the lesion is known. Even with no sputum present, examination of the fasting stomach contents obtained by lavaging in the morning should be carried out as part of the clinical study. After the apparent stability of the lesions is known, they should be followed with x-rays for many years about every three or four months at the start and always, at least once a year.

What should be the general practitioner's part in treatment of the *manifest* form of *active tuberculosis*? There is no reason for him not continuing to take an active part in the management of the patient with active tuberculosis after the diagnosis is established. Accordingly, he must fully appreciate certain fundamentals. First, the earlier appropriate therapeutic measures are applied, the sooner the patient ceases to be a menace and, in most cases, prognosis becomes proportionately more favorable. Manifest active tuberculosis is immediately treated with absolute bed rest. The question of a more active form of therapy is to be given immediate thought. Therefore, certain concepts of the treatment of pulmonary tuberculosis should be familiar to the general doctor that the infiltrative form of the disease often responds to bed rest under the proper regime, that more active treatment be considered at once where cavity exists, that, although certain types of small cavities often close without collapse treatment, still such results are exceptional rather than the rule, that not all cavities call for pneumothorax treatment, but that stabilized strictly apical cavities, not below the 2nd rib, may at times indicate immediate apical thoracoplasty rather than prolonged pneumothorax, that

unsuccessful collapse therapy of adherent cavity should not be continued because of serious hazards of dissemination of disease, rupture of lung and empyema

Relation to Public Health Agencies

The family doctor can render great aid by recognizing patients that require immediate hospitalization, because of poor home conditions, especially in the presence of children, or because of the severity of the disease. If means of segregation are not available, urging the patient to seek proper clinics or other sources for collapse treatment, is required. Collapse treatment is certainly possible at home, either while the patient is awaiting sanatorium admission, or under other circumstances. By this means the sputum is rendered free of tubercle bacilli and the disease is controlled, so that hospital or sanatorium care may not be needed.

While the patient awaits admission to a sanatorium, the physician instructs him as to precautionary measures. Consultation clinics of the city are always available to the family physician, where the closest cooperation is afforded him, not only for aid in diagnosis, but also in treatment. City tuberculosis hospitals and country sanatoria likewise, to which he may refer patients for active treatment and from which he should receive them on their discharge, are at his

disposal

In the management of patients requiring pneumothorax treatment, the general physician should not divorce himself from the case even though the collapse therapy is carried out by a specialist. This is particularly necessary because he, after all, is the one to handle the patient and the family in the many years of after care. It goes without saying that, should the family doctor have had special training in pneumothorax therapy so that he himself is capable of carrying this out, the treatments should not be given without the aid of a fluoroscope or x-rays.

In the after-care of his patients, he is to realize the great importance of routine re-examinations, including x-rays and sputum studies, especially at the start of return to work, with the frequency of about once a month and later every few months. Finally, the general physician may play the greatest part in reducing to a minimum the number of relapses by close supervision of working hours and working conditions, and by recognizing the seriousness of adverse home conditions, with surrounding poor hygiene. His active part as intimate adviser of the family in pointing out these hazards and suggesting methods of diminishing them should have the most profound influence in the avoidance of future breakdowns.

SIXTH ANNUAL MEETING AMERICAN COLLEGE OF CHEST PHYSICIANS

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(See page 120 for Preliminary Report)

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The Chemotherapy of the Pneumonias*

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Newark, New Jersey

The chemotherapy of the pneumonias at present resolves itself into a study of the sulfanilamide compounds. After a diagnosis of pneumonia is made, whether lobar or lobular, it is important to determine, if possible, the bacteriological background. This is done for two main reasons, first, to ascertain which one of the sulfur-benzene compounds to select and, second, to have specific serum available if the drug fails. As for anti-pneumococcus serum, we have employed it immediately in conjunction with the drug in all cases exhibiting positive blood cultures and severe toxemia. Sulfanilamide or neoprontosil seem most effective in streptococcal infections, sulfapyridine in pneumococcal diseases and a comparatively recent addition to our therapeutic armamentarium, sulfamethylthiazol in staphylococcal pneumonias. Virus infections of the pulmonary system seem resistant to all these chemotherapeutic agents. If the disease is of unknown etiology, of a rarer nature, or there is a mixed bacterial flora, it is worthwhile trying sulfapyridine first.

Before going into further detail, it seems fitting to briefly present a historical review. For many decades physicians had been using quinine and, if one notes the related chemical structure, perhaps the favorable reports of this drug are understandable. At the monthly meeting of the Dusseldorf Dermatological Society in May, 1933, Dr. Foerster¹ introduced, with a few brief remarks, the chemotherapeutic agent which was to be known as prontosil and regarded by many observers as the greatest therapeutic discovery in modern medicine. It is interesting to note that although a remedy against streptococci, it was first used in staphylococcal infections. The entire story is absorbing. In 1908, Gelmo² synthesized para amino benzene sulfonamide and soon similar preparations were used to develop dyes for textile purposes, for these preparations were distinguished by greater fastness in washing and milling than

sulfonamide free products. In 1913, Eisenberg³ noted that the dye was bactericidal in vitro. Then there was a real gap before this knowledge was utilized and clinical trials employed. After Foerster's remarks in 1933, several reports were offered, but no scientific experimental data relating to prontosil had been presented. However, in the February 15, 1935 issue of the *Deutsche Medizinische Wochenschrift*, Gerhard Domagk⁴ forwarded an epoch-making communication, stating that prontosil, a relatively non-toxic red-dye, when given by mouth in small doses, prevented the evolution of the otherwise fatal hemolytic streptococcal infections in mice, controlled and cured chronic streptococcal infections in rabbits, and favorably influenced the course of staphylococcal infections in rabbits, but that the drug was without effect in the treatment of certain pneumococcal and other experimental infections. Soon Levaditi and Vaisman⁵ of France employed the drug, confirming Domagk's work. English interest in the German investigations dates from March, 1935, with clinical trials on patients suffering from puerperal sepsis. American interest in and knowledge of the new chemotherapeutic compounds lagged well behind that of Europe and they were first used by Dr. Ashley Weech at the Babies' Hospital in New York City, July, 1935. Now the interest in America is keen and ardent and rapid strides have been made. Many new and related compounds are being synthesized and given clinical trials. It is interesting to note the inter-related chemical structures of the various derivatives.

In general, it may be said that a great proportion of the drug is absorbed in the gastro-intestinal tract and distributed through the blood stream to all parts of the body. Part of the drug is found in the blood in a free state and part is conjugated by the liver to form the acetylated compound. Chemical levels closely approximating blood levels may be noted in spinal fluid, pleural exudates and other body fluids. The drug is excreted chiefly in the urine. Sulfapyri-

* Presented before the Hunterdon County Medical Society of New Jersey, January 23, 1940.

dine is more capricious and irregular than other allied drugs in these respects

So far, although several theories, notably those of Levaditi and Lockwood⁶, have been offered, none adequately explains the mode of action of these sulfur-benzene derivatives. Long and Bliss⁷ feel that for the time being, one must be content with the simple conception that they inhibit the growth of susceptible micro-organisms in the body and in the test tube

The dosage of the drug varies with the age and weight of the patient and the severity of the disease. For the streptococcal infections of moderate severity sulfanilamide, 15 grains every four hours, day and night may be given for the average adult weighing 150 pounds. The patient is gradually weaned from the drug, when the temperature reaches an approximately normal level. A blood level of 4-8 milligrams per cent is attained. For severe illness, one may give an initial dose of 50-75 grains and maintenance doses of 20 grains every four hours. If the parenteral route, subcutaneous or intramuscular, is selected because of expediency or gastro-intestinal upsets, then neoprontosil, 50-60 cc of 5 per cent solution, may be used daily for a severely ill patient (about $\frac{1}{2}$ cc per pound of body weight, up to 120 pounds). Patients receiving neoprontosil will have orange or pinkish discoloration of the skin, excretions and secretions. This will disappear after the drug is stopped.

Sulapyridine, of course, is the drug par excellence in pneumonia. It comes in powdered form or 5 gram tablets. In infants and children, the dosage is 10, 15, 20 grams per kilogram of body weight, depending on the severity of the illness. In the average adult, the dose is 2 grams initially and 1 gram every four hours thereafter. However, in more severe cases, to attain a higher blood level larger doses may be given. It is not necessary to give sodium bicarbonate with this drug, as is the usual routine with sulfanilamide. Sulfapyridine may be given rectally with sodium bicarbonate and water when vomiting is present. There is also a sodium salt for intravenous use.

It is well to mention here the latest addition, sulfamethylthiazol—believed to be most effective of all in staphylococcal pneumonias.

Two grams of powder are prescribed in condensed milk every two hours for three doses, then 15 grams every two hours for three doses, and, finally, 1 gram every four hours. A soluble solution for intravenous usage is now being prepared.

Auxiliary treatment consists of proper diet, proper fluid intake, transfusions, surgical treatment when necessary, and almost any other essential drug. Saline purgatives are avoided as a rule.

The effects of these drugs have been truly remarkable and, in general, it may be stated that they have shortened the duration of the illness and lowered the mortality rate. Statistics cannot be properly analyzed and it is still controversial as to whether or not there are fewer complications, especially empyema. We have noted repeatedly precipitate declines in temperature and pulse rate. This has been true of cases of bacteremia, as well as in those whose blood cultures were sterile. Sometimes, the decline is more gradual. Because of the relatively low cost and availability of this drug, its usage has been wide spread and it has greatly superseded serum therapy, which has a higher cost and requires accurate typing centers.

Toxic manifestations attendant upon the usage of these drugs must be recognized. The following are the more important:

1 *Nervous system* Headache, tinnitus, vertigo, somnolence, mental depression, peripheral neuritis may be present. Gastro-intestinal disturbances, especially anorexia, nausea and vomiting must be listed here, because it is believed that they are chiefly of central origin. Nicotinic acid may be used to combat this syndrome.

2 *Cyanosis* This has been attributed to both sulfhemoglobinemia and methemoglobinemia. However, the theory of Marshall and Walz⁸ that a pigment discoloring the red cells produces the cyanotic tinge, seems more plausible. Methemoglobinemia may be treated with methylene blue.

3 *Acidosis* This is more commonly found with sulfanilamide and may be counteracted with sodium bicarbonate.

4 *Fever* More than five per cent of cases reveal a secondary rise, due to the drug. However, occasionally it may be a more ominous sign, pointing to a blood dyscrasia or

a complication

5 Depression of spermatogenesis has been reported

Thus far, except for peripheral neuritis, no indication for stopping the drug has been mentioned. However, the drug must be discontinued under the conditions to be mentioned

6 *Disturbances of the white cells* Neutropenia or frank agranulocytosis can occur and fatalities have been reported

7 *Disturbances of the red cells* Mild to severe anemias, including acute hemolytic anemia can occur. It is not uncommon to find a hyperleukocytosis with these conditions. It is well to mention that in agranulocytosis and acute hemolytic anemia, daily blood transfusions are essential

8 Renal irritation with hematuria and hepatitis are uncommon. However, renal calculi and other urinary stones may occur with sulfapyridine

9 *Dermatitis* Angioneurotic edema, purpura, urticaria, erythema and morbilliform rashes have been reported. Whether or not the drug should be stopped is controversial, but its continuance should be weighed against the severity of the illness

The only real contra-indication to the institution of the derivatives is a previous history of drug toxicity. Because of the various factors involved, a complete daily work-up of the case should include a blood count, urine analysis, blood pressure readings, blood chemical levels, and a recording of the intake and output of fluids. The value of the drug has been discussed, but it is also important to stress the misuse. It should not be employed in colds, gripes, and numerous other infections, unless the indication is definite. It can be said that we not only have a widely used drug, but also a frequently abused preparation

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The Value of the Tuberculin Skin Test in Early Diagnosis of Tuberculosis

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The infectious nature of tuberculosis has been known for more than fifty years, still the percentage of advanced cases admitted to sanatoria continues high. There has been too much waiting and hoping for a specific cure. While great strides have been made with collapse therapy, tuberculosis continues its insidious destruction.

Tuberculosis is a preventable disease. How can the number of advanced cases be reduced? Without a specific cure, there is one remaining hope. *Preventive Medicine*. Here indeed is a challenge to the medical profession. Discovering and treating tuberculosis in the minimal stage is, in a sense, practicing preventive medicine, because a cure in the

advanced stage is somewhat problematical.

The tuberculin skin test sifts out infected individuals like a super magnet drawing a needle out of a haystack. Except for roentgen examination, it is the only method of today which makes known the presence of tuberculosis before clinical observations can be made.

In office practice, the intra-dermal skin test with Tuberculin P.P.D. (purified protein derivative) should be the method of choice, as it is made up fresh when wanted and can be given in accurately measured doses. This does away with the fear of severe reactions in hypersensitive individuals and also non-specific results from too old a tuberculin. Finding a positive reactor, necessitates the

* Herman Kiefer Hospital

taking of a chest x-ray, without which the presence of active tuberculosis cannot be ruled out

Positive reactors who are found to have demonstrable healed or primary lesions, should be x-rayed yearly. Positive reactors with negative plates, who were known to have been close contacts, should be x-rayed every three months the first year, and yearly thereafter for at least five years.

An attempt was made to determine the most successful procedure in making an early diagnosis. Accordingly, five thousand case histories of tuberculosis were reviewed. From this study, the most striking fact was the apparent indifference of the general public to the seriousness of a persistent cough. The people must be made cough conscious, if much headway is to be made in the eradication of this disease. The dry, hacking cough was the earliest objective symptom mentioned, and was noted in virtually all the moderately and far-advanced cases.

The time interval between onset of cough and diagnosis averaged from three to six months in moderately advanced cases and from eight to fifteen months in far advanced cases.

These patients did not seek medical advice purely because of cough. Only the development of a catarrhal episode or hemoptysis caused them to seek medical advice. It was interesting to note in this connection that a great many of the minimal and moderately advanced cases were diagnosed early because hemoptysis occurred relatively early and alarmed the patient sufficiently to seek medical aid. Also, the percentage of hemoptysis in the entire series (19 per cent) is slightly lower than that seen in tuberculosis generally, since, in many cases, hemoptysis does not occur until after the patient enters the sanatorium.

Frequently, cough was the only symptom by which the clinical onset of the disease could be traced. Unfortunately, the cough cannot be used as a criterion for early diagnosis. The very nature of the cough mechanism infers that an exudate is present in the bronchial tree. When a parenchymal lesion develops and undergoes caseation or ulceration the disease may already have

obtained a firm foothold. Actually, the very earliest symptoms are subjective, being due entirely to the tuberculous toxin and its allergic manifestations.

When one first inhales the tubercle bacillus, it usually lodges somewhere in the upper third of either lung. At this point, one of two things occurs. Either a small tubercle develops in the parenchyma, or the organism is carried by the lymphatics to the deep glands of the chest. The healed tubercle becomes encapsulated and eventually calcified.

The parenchymal lesion may be so small and so situated that it will not cast a shadow on the x-ray plate. Frequently, the initial parenchymal lesion is large enough to be seen and will vary in size from 0.25 cm to 1.0 cm. This is termed the primary lesion or infection and is disregarded by x-ray men when reading chest films. However, this primary lesion should not be confused with a minimal lesion. Here, the area of density may also be about a cm in size, but will not be calcified. The small area of density will not have sharply defined borders, but will seem to fade off into the parenchyma of the lung.

These so called spots may be found in any part of the lung, but more commonly in the apex or infraclavicular region. There may be several of these areas of density in a minimal lesion providing the sum total of their area does not cover more lung than is included in an area extending from the apex of one lung to its second chondrosternal junction. The toxin produced by such a small lesion is not sufficient to cause any noticeable symptoms.

One having such a small lesion can go about his daily routine unsuspectingly, until he goes through a period of physical strain, at which time his body resistance is lowered. The minimal lesion which was formerly quiescent, but not healed, caseates and bacilli are spilled into the adjacent bronchioles or are disseminated by the lympho-hematogenous route. Contiguous infiltrations develop, coalesce, and in time involve a large area of lung. The increased amount of toxin first manifests itself by sensations of fatigue, anorexia, and increased irritability. The characteristic of the fatigue is that while it seems to dis-

appear with rest it returns immediately with the slightest amount of work or exercise

The anorexia first takes the form of aversions to various foods, and later, to a marked loss of appetite. A common complaint among advanced cases was that they had always been finicky about their meals. Increased irritability first manifests itself by the person becoming irked and annoyed with petty occurrences, which were formerly unnoticed. These mild subjective symptoms are not productive of many voluntary physical examinations.

The number of cases having the common insidious course of a pulmonary tuberculosis was 73 per cent. In this group, the minimal cases were 8 per cent, moderately advanced cases were 32 per cent, and far advanced cases, 60 per cent. Twenty-four per cent of the group studied had a so-called catarrhal onset. Although this was a small percentage it gains its importance from the fact that practically all the errors in diagnosis were limited to this group. Colds, bronchitis, "Flu," and pneumonia led the list of diagnoses made. These catarrhal episodes are often repeated several times before the patient finally de-the group studied had a so-called catharrhal

Many patients call these attacks colds, but in reality they are the result of new areas of infiltrations developing in the manner already described. Definite support of this is found in the appearance of chest films from all advanced cases. These show a mixed type of lesion in various stages of development. The period in which the minimal lesion developed was missed entirely. When the new area of infiltration is small, or if the allergic manifestations are mild, recovery takes place spontaneously, with only a loss of a few days or weeks. Unfortunately, the new infiltrations do not clear completely before other episodes take place.

Invariably, the tendency to improve after a few weeks in bed produces a false sense of security. Patients return to work with their general health at a lower level, but sufficient to carry on the daily routine. Many far-advanced cases had several recurrent supposed attacks of "flu" and rarely was a follow-up x-ray made.

Pleurisy with effusion frequently was diagnosed as pneumonia. These cases had a rather acute onset of fever, malaise, cough, and shortness of breath. Pleurisy which was usually present before onset of fever would disappear following the formation of fluid. Flatness and absent to feeble breath sounds on the affected side are usually present. A careful history will aid in diagnosis as many of these cases have an associated pulmonary lesion, or a history of contact.

Gastro-intestinal symptoms as the chief complaint, occurred in only a little more than two per cent of the cases. Diagnosis is not difficult if a chest plate is made in all doubtful cases. Appendicitis, gastric ulcer and gall bladder disease are most frequently confused with the symptoms of tuberculous enteritis or peritonitis.

In summing up the review, it is found that the persistent productive cough and the repeated catarrhal episodes were the main reasons for medical advice being sought. However, as was previously stated these symptoms did not aid in diagnosing early cases. Every minimal case was missed unless it happened to be a known contact, or hemoptysis occurred. Hemoptysis was the initial symptom in only 15 per cent of all the cases, so it cannot be used as a criterion for early diagnosis.

From the history and x-ray findings it seems logical to assume that the great majority of advanced cases are due to a reinfection from within. That is, a breakdown of a partially healed primary lesion, or a sudden spread of a minimal lesion, which had been quiescent, but not healed. A tuberculin skin test months or even years before would have shown the presence of tuberculosis, before advanced activity developed.

As the medical profession becomes more tuberculosis minded, more cases will be discovered before they have had a chance to infect others. Consequently, the percentage of positive reactors becomes smaller as the years go by. The time has come when a tuberculin skin test must be included in all differential diagnostic procedures.

Organization News

Program—Monday, June 10, 1940

AMERICAN COLLEGE OF CHEST PHYSICIANS

Sixth Annual Meeting

New York City

MORNING CLINIC SESSIONS

Lenox Hospital—9 00 A M to 11 00 A M

Medico-Surgical Clinic

Dr Carl Eggers
Dr John C Gerster
Dr Otto C Pickhardt
Dr H McLeod Riggins
Dr Dewitt Stetten
Dr Grant Thorburn

*Kings County Hospital—9 00 A M
to 11 00 A M*

- 1 "Primary Infection Tuberculosis"
Dr Frederick Bridge
- 2 "Early Manifestations of Pulmonary Tuberculosis"
Dr Milton Louria
- 3 "Bilateral Pneumothorax Therapy"
Dr Harry Reibstein
- 4 Clinical Case Reports

A "Early Diagnosis of Pulmonary Neoplasms"

Dr Ralph Romano

B "A Case of Blastomycosis"

Dr Jacob Rogoff

C "A Case of Pulmonary Tuberculosis Complicated by Hyperthyroidism"

Dr William Wagman

D "Unusual Lung Abscesses"

Dr Peter Amazon

E "Becks Sarcoid and Miliary Tuberculosis"

Dr Ida Levine

F "Pulmonary Neoplasms Associated with Pulmonary Tuberculosis"

Dr Abraham Bolker

G "Pneumothorax Therapy Followed by Acute Miliary Spread"

Dr Vincent Lacavara

H "A Case of Hypertension Followed by Addison's Disease"

Dr Sol Brandwein

Montefiore Hospital—11 00 A M to 1 00 P M

"Diagnostic Significance of Sputum Findings"

Dr Pinner—20 minutes

"Demonstration of Respiratory Tests and Bronchspirometry"

Drs Leiner, Weiss, and Zavod—30 minutes

"Pulmonary Abscess"

Dr Rosenblatt—20 minutes

"Presentation of Surgical Problems"

Dr Aufses—15 minutes

"Bronchial Tuberculosis"

Dr Cohen—15 minutes

"Hematogenous Tuberculosis"

Dr Rubin—15 minutes

AFTERNOON CLINIC SESSIONS

Sea View Hospital—2 30 P M to 4 30 P M

"Indications and Results of Cannulation of Giant Tuberculous Pulmonary Cavities"

"Demonstration of the Surgical Procedure"

Drs. Louis R Davidson and George G Ornstein

Bellevue Hospital—2 30 P M to 4 30 P M

"Clinical Problems in Thoracic Disease"

Drs Andrain Lambert, J Burns Amberson, Jr., and Frank Berry

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Dr James Alexander Miller
New York, New York

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Dr Ralph C Matson
Portland, Oregon

Bacteriology

Dr S A Petroff
Staten Island, New York

Physiology

Dr Dennison Richards

Bronchoscopy

Dr John D Kernen
New York, New York

X-Ray

Dr Maurice McPhedran
Philadelphia, Pennsylvania

Pathology

Dr Henry C Sweany
Chicago, Illinois

Biltmore Hotel—Sunday, June 9, 1940

Medicine

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Los Angeles, California

Surgery

Dr Richard Overholt
Boston, Massachusetts

Bacteriology

Dr S A Petroff
Staten Island, New York

Physiology

Dr Andre Cournand
New York New York

Bronchoscopy

Dr Mervin C Myerson
Brooklyn, New York

X-Ray

Dr H L Sampson
Saranac Lake, New York

Pathology

Dr Henry C Sweany
Chicago, Illinois

DISTRICT MEETINGS OF FELLOWS OF THE COLLEGE

Dr Harry Warren, Chairman of the Sanatorium Committee of the College, and Dr William C Voorsanger, Governor of the College for California, arranged for a meeting of the Fellows of the College at San Francisco on March 8, 1940. Guests were invited.

Murray Kornfeld, Executive Secretary of the College, gave a report on the progress made by the College to date and extended an invitation to the Fellows in the Bay District, through the Chairman of the Board of Regents, to attend the Annual meeting of the College to be held at New York City in June.

Dr Chesley Bush, past president of the National Tuberculosis Association and Mr Ward

Higby, Executive Secretary of the California Tuberculosis Association, attended the meeting.

Dr Ralph C Matson, President of the American College of Chest Physicians, presided at a meeting of the Fellows of the College from the State of Oregon held on March 11th, at Portland Oregon. Mr Murray Kornfeld, Executive Secretary of the College, reported on College activities, and the work of the College was heartily endorsed by the Fellows present.

Oregon's new teaching center for diseases of the chest was inspected by Mr Kornfeld and he reports that it is an institution of which the State of Oregon can well be proud. Every facility for the postgraduate teaching of chest diseases is available at the hospital, which is connected with the University of Oregon Medical

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School, and two Fellows of the College are now taking postgraduate work at the hospital Dr Matson is the Medical Director of the new hospital

CORRECTIONS

It has been called to our attention that the spelling of Dr Jaharlal Ghosh's name, published in the November, 1939 issue of DISEASES OF THE CHEST, and that of Dr Donato G Alarcon's name, published in the March, 1940 issue of DISEASES OF THE CHEST, were incorrect The above spellings are correct

NEW FELLOWS OF THE COLLEGE

The following physicians have been admitted as Fellows of the College during the months of December, January, February and March

- Dr Leslie P Anderson, Elma, Washington
- Dr Indubhusan Basu, Calcutta, India
- Dr James Shields Conant, Portland, Oregon
- Dr Jules Myron Davidson, New Orleans, Louisiana
- Dr Everett Cato Drash, Charlottesville, Virginia
- Dr Israel George Epstein, Brooklyn, New York
- Dr M James Fine, Newark, New Jersey
- Dr Alvis Eugene Greer, Houston, Texas
- Dr Joseph Hartman, New York, New York
- Dr Leon Hughes Hetherington, Pittsburgh, Pennsylvania
- Dr James V Jaso, South Orange, New Jersey
- Dr A Holmes Johnson, Kodiak, Alaska
- Dr Israel Kahalas, Boston, Massachusetts
- Dr Edwin Rayner Levine, New York, New York
- Dr Shu-Fan Li Hong Kong, China

Dr William Paul Maddux, Mount Vernon, Missouri

Dr Savere F Madonna, Philadelphia, Pennsylvania

Dr Antonio Navarrete, Havana, Cuba

Dr B C Roy, Calcutta, India

Dr Martin Lee Stephensen, Jr, Sanatorium, Texas

Dr Emanuel Milton Weinberger, Philadelphia, Pennsylvania

Dr Irving Willner, Newark, New Jersey

STATE TUBERCULOSIS MEETING

The California State Tuberculosis Association will meet in Santa Barbara, California, April 11-13, 1940 For further information write to Mr Ward F Higby, Executive Secretary of the California Tuberculosis Association, San Francisco, California

TUBERCULOSIS COMMITTEE ACTS AS CLEARING HOUSE

The Annual luncheon sponsored by the Tuberculosis Committee of the Texas State Medical Association will be held on Tuesday, May 14th, at the Baker Hotel, Dallas, during the meeting of the Texas State Medical Association Dr R B Homan, Sr, is the Chairman of the Tuberculosis Committee and Dr H Frank Carman, Regent of the College for the State of Texas, will preside at the luncheon

These luncheons were inaugurated last year at San Antonio to act as a clearing house for state problems in tuberculosis Representatives from various interested organizations, such as the state tuberculosis association, the state public health group, etc, are invited to attend and actively participate in the discussions

A further report on this luncheon will appear in these columns

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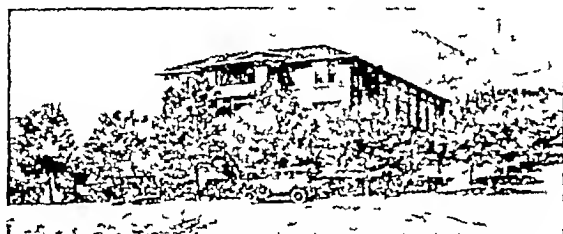
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For the third successive year, the Pennsylvania Tuberculosis Society is offering a scholarship of \$300.00 for postgraduate study at the Trudeau School of Tuberculosis, Saranac Lake, New York. The scholarship is open only to Pennsylvania physicians and preference will be given to a physician engaged in the private practice of medicine and resident in a small or rural community who has not had special training or experience in tuberculosis.

Applications and inquiries for further information should be forwarded at once to the Pennsylvania Tuberculosis Society, 311 South Juniper Street, Philadelphia, Pennsylvania.

ADDRESSES BY FELLOWS

Dr. Jay Arthur Myers, Regent of the College for regional district number 9, addressed a joint meeting of the Chicago Pediatric Society and the Chicago Tuberculosis Society on March 19th. The subject of his talk was the *Relationship of First Infection to Clinical Tuberculosis*.

Dr. George E. Martin, Fellow of the College, spoke before the March 19th meeting of the Allegheny County Medical Society on the *Trend of Tuberculosis in Pittsburgh*.

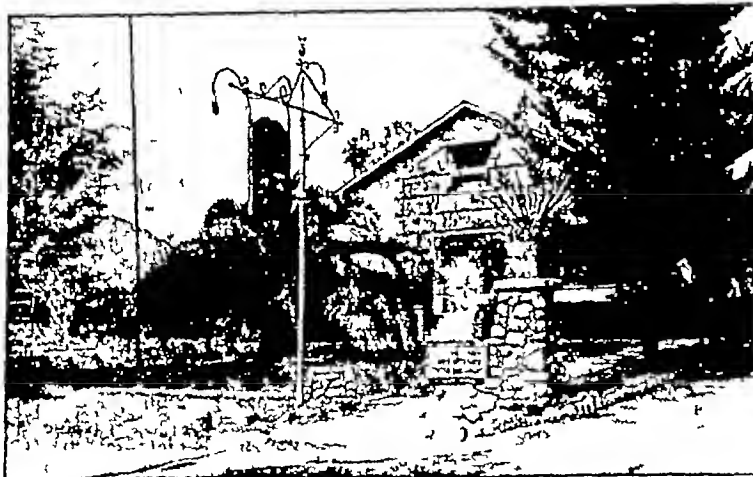
On January 9, 1940, Dr. Miguel Canizares, Governor of the College for the Philippine Islands, spoke before the Manila Medical Society, of which he is the retiring president.

Dr. Chevalier J. Jackson, Philadelphia, Pennsylvania, a Fellow of the College, addressed the Trudeau Society of Boston on January 25th. The subject of his talk was *Bronchoscopy in the Treatment of Thoracic Disease*.

PRIZES OFFERED FOR SCIENTIFIC RESEARCH

A prize of \$250 for work in thoracic surgery is being offered by the Rose Lampert Graff Foundation of Los Angeles through the American Association for Thoracic Surgery. Further information can be obtained from Dr. Richard H. Meade, Jr., 2116 Pine Street, Philadelphia, Pennsylvania.

The Leon Bernard prize of 2,500 French francs is being offered by the International Union Against Tuberculosis. Information is available through the National Tuberculosis Association, 50 West 50th Street, New York City.



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- 29 -USE OF X RAY IN TRACING THE REACTIONS OF TUBERCULOSIS IMMUNITY
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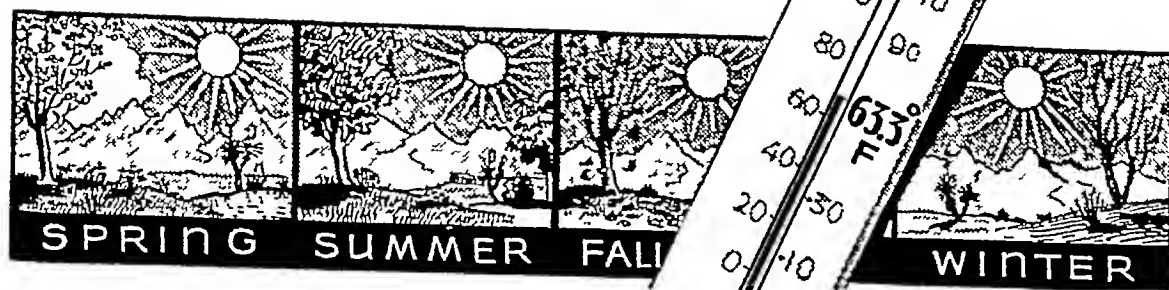
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AND PATHOGENESIS (Page 71)

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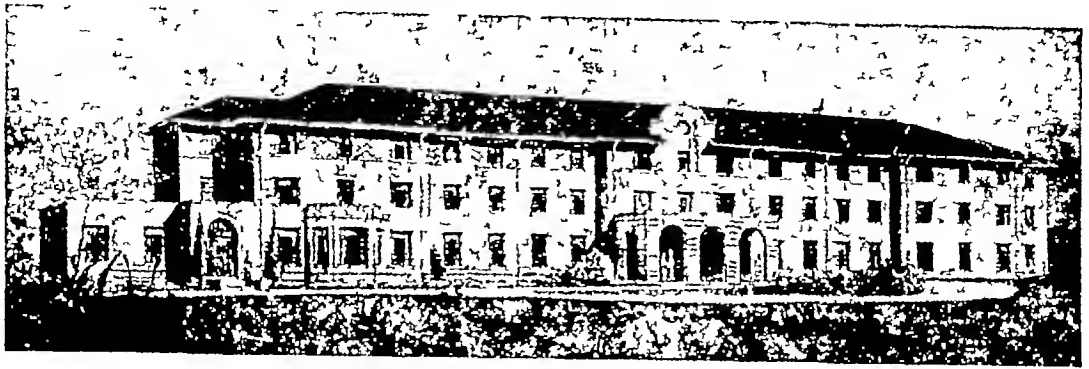
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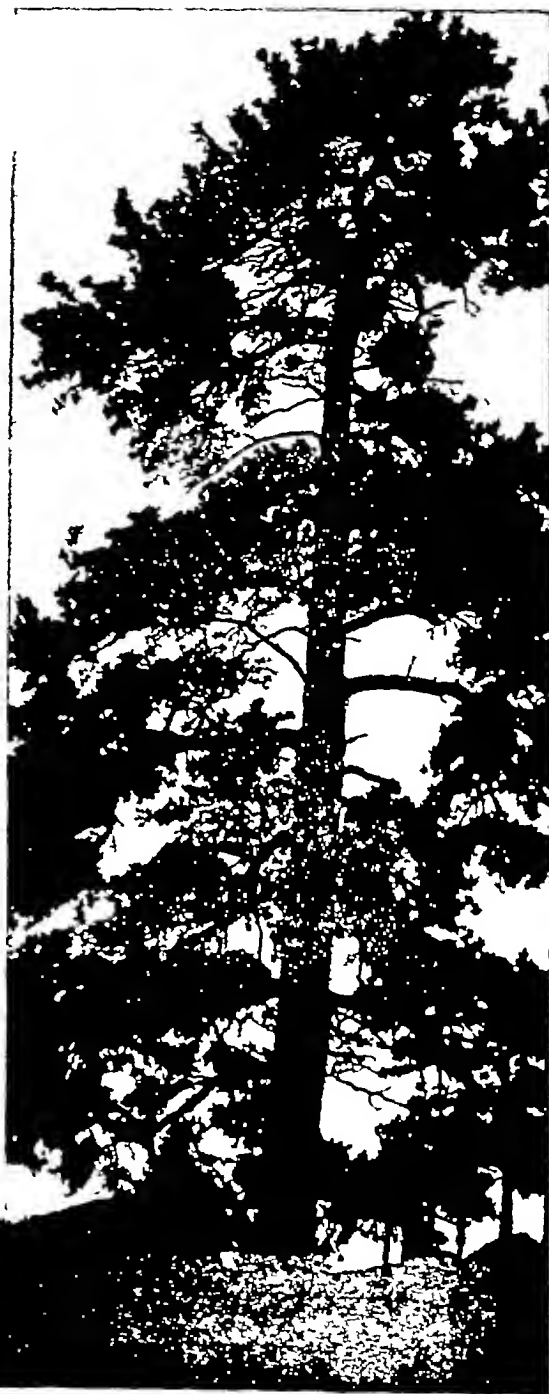
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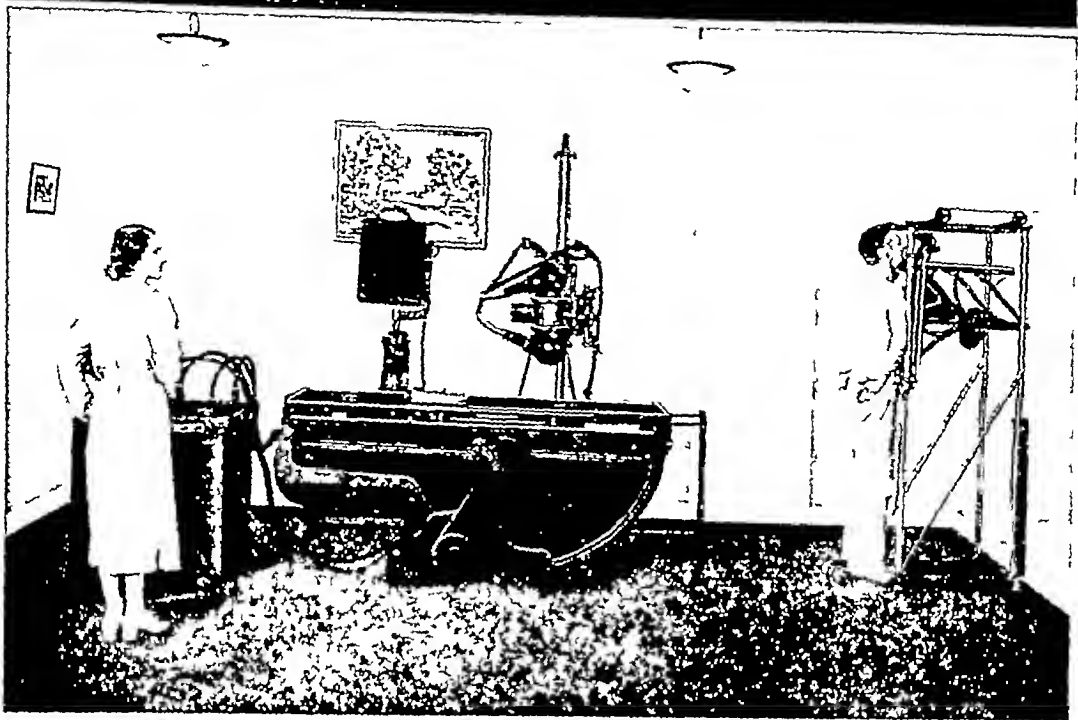
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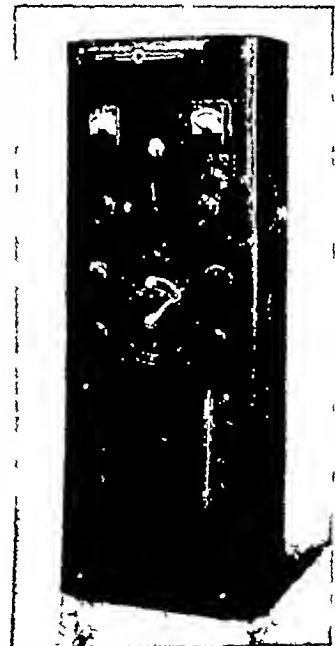
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Editorial Comment

It Hasn't Worked Many millions of charity dollars have been collected and spent in attempting to educate the public concerning the facts of tuberculosis during the last thirty-five years. According to a recent Gallup Survey only 19 per cent of the public know that tuberculosis is caused by a germ. Judging by this survey, it would take 150 years to educate the public to the simple fact that tuberculosis is caused by a germ. It is probably safe to assume that this same 19 per cent is being reached year after year by the publicity campaigns directed to the public. Evidently, the other 81 per cent of the population has not yet been reached and there is no assurance that they will ever be reached through our present program of education. Should future millions, contributed to eradicate tuberculosis, be similarly squandered on salaries for so-called teachers of the public? Our answer is emphatically, NO!

This is not being written as an unkind criticism of the past actions of any individual or group. We just did the best we knew. But, now we know better.

Educating farmers never eliminated tuberculosis from bovine herds. The veterinarian had to go into the herd, find the tuberculous animals and then separate the in-

fectured from the healthy. Then, and only then, did we see significant elimination of bovine tuberculous infection.

In view of our present knowledge concerning case finding in tuberculosis, we suggest that a large portion of the money now being spent on education be directed toward case finding, toward the type of case finding that is most neglected. By this, we mean the x-raying by rapid method of the manual worker. A survey of manual workers will yield six times as many infected and infectious cases needing treatment as will a survey of college or other "white collar" groups. And since groups can be surveyed at a rate of seventy-five cents a person, organizations which spend three dollars and fifty cents a person for surveys will find explanations difficult to make when they are called to account. And one thing is certain, an accounting day always comes sooner or later. Quoting Dr Esmond Long, "Look for tuberculosis where it is to be found."

Monies spent in this direction would be certain to produce beneficial results. Not only will we be finding open cases of tuberculosis, but at the same time, we will be enlisting the aid of many physicians who show no interest in tuberculosis under the present program.

We know that changing the direction of the flow of funds, donated to eliminate tuberculosis, from education to case finding will require sacrifice—sacrifice of salaries and jobs that are time honored. But, isn't it better to sacrifice jobs than to let human beings go on dying of tuberculosis and spreading it, unknowingly, until shortly before they die?

With all of our education and despite all of the millions spent in this direction during the past thirty-five years, still 80 per cent of the tuberculous have advanced disease when they are discovered. This percentage matches well with the insignificant 19 per cent of our population who know that tuberculosis is caused by a germ.

Now that we know the facts, how much longer are we going to continue the squandering of public funds? The officials of organizations who are accepting such funds from a trusting public must take cognizance of these facts.

Let us PAY for case finding WORK and not for talk and let us do it NOW

F W B

The Dawn There are a few bright spots on the horizon which foretell the coming of another and better day in the War of Tuberculosis Eradication.

Last year the Brooklyn Tuberculosis and Health Association (N Y), a component of the National Tuberculosis Association, out of gross income of \$62,000 00 from the sale of Christmas Seals, spent \$16,043 00 on case finding through utilization of the inexpensive rapid film method of x-ray.

Last year the Queensboro Tuberculosis and Health Association (N Y), another of the National Tuberculosis Association components, with a gross from Christmas Seals of \$58,000 00, similarly expended \$15,777 00.

These organizations are finding cases, the cases are being segregated and many of them cured. These organizations can teach many of us something, many of us who like so well to talk about teaching others what they need to know about tuberculosis eradication. How much easier and more comfortable it is to teach than to learn!

One of the present activities of the Brooklyn Association is the encouragement of the public to get a chest x-ray done for ONE

DOLLAR. They widely advertise through press and handbills that on the First and Third Mondays of every month between 2 and 6, and 7 and 9 p.m., x-rays of the public will be taken at certain convenient locations throughout Brooklyn. They also stress the fact that Christmas Seals help pay the cost. Doctors must remember that these facilities do not compete with the local x-ray specialist, that every case found by survey methods is referred to the Family Doctor, or, if indigent, to the clinic physician. Every survey means help in the eradication of Tuberculosis through finding tuberculosis cases earlier, and brings worthwhile work to the doctor and x-ray specialist at a stage when the reputation of the Medical Profession can be enhanced by the effect of treatment.

F W B

"Nose Drops" The danger of intra-nasal medication and the particular difficulty in removal of aspirated liquid petroleum suggests that this oil should not be used in the respiratory tract, and that when given orally, care should be exercised to prevent the aspiration of it.

Lipoid pneumonia is not uncommon as a result of the aspiration of various oils. Patients of any age with some central nervous involvement are quite prone to aspirate oil when introduced intra-nasally. This is also true in small infants with debilitating diseases, or those in which repeated vomiting occurs. Other patients, usually adults, who use oils over long periods of times as nasal douches and laryngeal sprays are constantly exposing themselves to lipoid pneumonia.

A large factor which enters into the development of lipoid pneumonia is the type of oil inspired. These may be grouped into three classes—vegetable oils, animal oils and mineral oils. The slight anesthetic action of menthol and similar compounds probably aids in the passage of some of this oil into the larynx and trachea.

Promiscuous use of nose drops with an oil base should be discouraged, especially in infants, because of the great tendency to lipoid pneumonia, which not infrequently proves fatal.

C M H

The Role of the General Practitioner in Pulmonary Tuberculosis

Epidemiology and Pathogenesis*

MAX PINNER, M.D., F.A.C.P.**
New York City, New York

Epidemiological Data

The problem of tuberculosis is complex, because it is a frequent disease, because it is a contagious disease, because it is an exquisitely chronic disease and because its social and economic implications are frequently of such a nature that they overshadow in complexity and importance the purely medical aspects. Since it is frequent, so frequent still, that it is the most important cause of death in early adult life, it deserves the fullest attention of all agencies concerned, first amongst whom stands, as I hope to show, the private physician. Since it is contagious, every physician attempting to help in its treatment or prevention, must consider himself a public officer and must visualize his duties to be beyond the care of the individual patient in the preventive field. Since it is a chronic disease, born in poverty and producing in its turn poverty, the physician must become a social worker and must be wide awake to the socio-economic background of his patients.

In order to attack a problem intelligently one must know its nature and its magnitude. Through the courtesy of Mr. Drolet, the statistician of the New York Tuberculosis and Health Association, I can present a few figures concerning tuberculosis in our own borough, the Bronx. Our most reliable statistics concerning tuberculosis are still mortality statistics. In the first table are presented the number of annual deaths and the death rates during the decade 1929, to 1938, showing an encouraging decline in the death rate and the relatively good standing that the Bronx makes in comparison with New York City as a whole. The second table shows the actual number of known cases for each year during the last decade. The question then arises as

TABLE I

*Tuberculosis Mortality, Borough of Bronx
and City of New York*

1929—1938

Year	Deaths	Bronx Rate*	New York Rate*
1929	695	57	75
1930	702	55	73
1931	645	49	70
1932	578	43	64
1933	652	48	64
1934	599	43	61
1935	557	39	60
1936	642	45	62
1937	569	39	57
1938	522	35	51

*Based upon reports, Department of Health,
City of New York * Per 100,000 population*

TABLE II

*Bronx—Tuberculosis Registration
Ten Year Period, 1929-1938*

Year	New Cases* Number	Reported Case Rate ¹	Remaining in Register End of Year ²
1929	1,924	157	4,368
1930	1,672	131	3,159
1931	1,651	126	3,218
1932	1,525	114	2,715
1933	1,396	103	2,716
1934	1,409	102	2,662
1935	1,303	92	2,873
1936	1,216	84	2,800
1937	1,252	85	3,201
1938	1,136	76	3,111

*Based upon reports, Department of Health,
City of New York * All forms of tuberculosis
1—Per 100,000 population 2—Pulmonary cases
only on December 31*

* Read before the Bronx County Medical Society as part of a Symposium on the Role of the General Practitioner in Pulmonary Tuberculosis, November 15, 1939

** Editor, *American Review of Tuberculosis*, Chief Division of Pulmonary Diseases, Montefiore Hospital, New York City

to whether or not we know all the living cases. By comparing, in Table III, the known cases each year with the corresponding deaths,

it can be seen that for every death, from 4 to 6 living cases of tuberculosis are known in the registry. Although there are good reasons to assume that the actual ratio of living cases to deaths is higher, probably about 9 to 12, the ratio existing in the Bronx compares favorably with many other communities and is indicative of active and efficient case-finding work and a high degree of the reliability of reporting. We should next have to know in what condition the newly diagnosed cases are found. For this, only the new cases diagnosed in the Tuberculosis Clinics of the Department of Health are available, as shown in Table IV. The fact that nearly 50 per cent of these cases were minimal in 1938 is most gratifying, but it must be kept in mind that the table contains only the cases diagnosed in the Clinics and these represent less than one-half of the total new cases for 1938 which amounted to 1136. Judging from hospital admissions in the whole metropolitan area, or in the United States, there is still a woefully small percentage of minimal lesions.

TABLE III

*Ratio of Known Cases to Death
For Period 1929-1939
(Bronx)*

Year	Cases in Registry, End of Year	Deaths	Ratio Cases to Death
1929	4368	695	6.5
1930	3159	702	4.5
1931	3218	645	5.0
1932	2715	578	4.7
1933	2716	652	4.2
1934	2662	599	4.4
1935	2873	557	5.1
1936	2800	642	4.4
1937	3201	569	5.6
1938	3111	522	6.0

With the knowledge that we have approximately 3100 diagnosed cases in the Bronx, meaning one case in about every 500 persons alive, it becomes important to know how these cases are distributed throughout the community. If they are evenly scattered, we must either rely on chance examination to discover these cases, or we must examine the entire population to find them. However, all avail-

TABLE IV

*New Cases Diagnosed in Tuberculosis Clinics
During 1938*

Borough of the Bronx and New York City

	Bronx	
	Number	Percent
Pulmonary		
Minimal	204	48.0%
Mod. Advanced	146	34.4%
Far Advanced	75	17.6%
Total Active	425	100.0%
Arrested	10	
Non Pulmonary	0	
Childhood Type	56	
Total	491	

Based on reports by courtesy of associated clinics to the Tuberculosis Clinic Committee, New York Tuberculosis and Health Association

able data on tuberculosis indicate that certain groups of the population are much more afflicted by this disease than others, hence the case-finding activities must be selective to yield the best results. There is first the uneven distribution according to ages. This is shown in Table V, for the whole United States rather than for the Bronx, because the smaller area is more likely to yield chance distortions. It is shown in terms of death rates instead of morbidity rates, not by choice but by necessity, since we have no complete and reliable morbidity statistics.

TABLE V

*Deaths and Death Rates From Tuberculosis
United States — 1937*

Age Groups	Number of Deaths from Tuberculosis, All Forms	Death Rate per 100,000 Population
All ages	69,324	53.6
Under 5	1,931	18.0
5-9	599	5.0
10-14	1,054	8.3
15-19	3,982	33.1
20-24	7,088	61.6
25-29	7,550	70.4
30-34	6,931	71.5
35-39	6,557	73.5

40-44	6,492	71 8
45-49	6,119	78 9
50-54	5,409	80 5
55-59	4,499	80 9
60-64	3,685	89 1
65-69	3,225	99 8
70-74	2,031	92 4
75-79	1,349	104 4
80 and over	771	85 2

From the fact that the death rate in early childhood is relatively low the erroneous conclusion has been drawn that tuberculosis in this group pursues a mild and benign course. The death rate is an indication of the relative rarity of the disease in early childhood rather than of its benignity. The fatality rate of infected children up to five years of age in New York City in the period of 1930 to 1932 was, according to Drolet, 430, as compared with approximately 140 for the age group of 20 to 50. We have seen that in the Bronx we had at the end of 1938 six times as many cases as deaths during the year. If we use this factor of six, we will find, for example, that between the ages of 5 and 14 we would have to examine more than 2500 children to find one case of clinical disease, that, on the other hand, in the age group above 25 we would have to examine only about 200 persons to find one clinical case.

There exists a parallelism between tuberculosis mortality and socio-economic conditions which should direct case-finding efforts into definite channels, it indicates at the same time a most powerful factor in the pathogenesis of the disease. The dependence of tuberculosis mortality on economic conditions may be further emphasized by the survey work of the Department of Health of New York City. Dr. Edwards has found in surveys comprising about 200,000 persons that approximately 2.5 per cent of the individuals that were x-rayed showed clinically significant lesions of pulmonary tuberculosis, in high school students and in students working under the National Youth Administration, 0.3 and 1.0 per cent, respectively, were found. On the other hand, when close to 5000 homeless transient males with an average age of about 50 years, economically poor and maladjusted, as a whole were surveyed, 5.3 per

cent were found to have clinically significant lesions.

To point out further the concentration of tuberculosis in certain population groups, it must be remembered that the tuberculosis mortality for the Negro is about 3 times as high as that for the white in the whole United States. However, in New York City, the adolescent Negro has a death rate 15 to 40 times higher than the white in the same age group. The Irish are considerably more susceptible than the Jews, young women throughout their child-bearing period contract the disease more frequently than men of the same age, persons living in close contact with contagious cases have a higher morbidity than non-contact cases, certain constitutional types are more endangered than others and, finally, certain diseases, diabetes for example, increase the susceptibility to tuberculosis.

Such figures are, of course, of fundamental importance in case-finding activities where, with limited funds, the optimal results must be obtained. For the private practitioner in individual practice, the problem is somewhat different. He does not select from a large population certain groups promising to yield the greatest percentage of cases. He must find the case whether the chance is one in 3000 or one in 10. He should, therefore, whenever opportunity presents itself, think of tuberculosis and exclude it with adequate diagnostic technique. However, this chapter belongs in the next paper.

Having diagnosed and registered the cases here in the Bronx, what happens to them? The next table provides the answer for the 3131 cases on the registry in the Bronx at the end of September, 1939. It is only necessary to point out that the private physician takes care of a greater percentage of tuberculosis cases than any other agency to justify the fact that this Medical Society is devoting one evening to the discussion of tuberculosis. Unfortunately, there are no definite data available to show the practitioners' participation in the diagnostic activities. However, in Detroit, where tuberculosis case-finding is a matter of closely knit cooperation between practitioners and Health Department, about 30 per cent of adult-type active tuberculosis was diagnosed in the minimal stage.

TABLE VI

*Type of Care of 3131 Known Cases in Bronx
Sept 30, 1939*

	Cases	Per Cent
Private Physician	1047	34
Hospitals and Sanatoria		
In City	636	20
Out of Town	386	12
Clinic Care	739	24
At Home	197	6

It is probably a surprise to see that only 20 per cent of Bronx patients are in institutions in the city and that only a total of 32 per cent are hospitalized at all. The next table explains why. The discrepancy between bed capacity and known cases of tuberculosis is obvious. What is true of New York City is true of the country as a whole. There is good evidence to assume that there are more than half a million cases of tuberculosis in the United States of America, there was a total bed capacity of 89,692 in 1938. In the different states, the ratio of beds to annual deaths varies from a low of 0.2 in Alabama to a high of 4.0 in Colorado, with New York State, whose ratio is 2.1, standing above the average for the whole country which is 1.4.

TABLE VII

*Total Bed Capacity and Actual Occupancy
New York City and Known Cases
June 30, 1939*

	Bed Capacity	Occupancy	Cases in Register Dec 31, 1938
All 25			
Institutions	5,457	5,812	19,758
		(106.5%)	

Obviously, not all patients with tuberculosis can be hospitalized, nor do they all need hospital care. With the limited facilities available, it becomes fundamentally important—and here lies with his diagnostic duties, the greatest responsibility of the private physician—to utilize the available beds in the best possible manner. There are, mainly, two medical reasons for hospitalizing a tuberculous patient: (1) the need of active treatment, and (2) the need of isolation since he is a source of contagion. The indications for hos-

pital treatment will be discussed by Dr Mayer.

Can we isolate in hospitals and sanatoria all sputum-positive cases? Obviously not. Which cases, then, should be selected for isolation? The most dangerous ones. Does this mean chiefly the patient with far advanced, cavernous, hopeless tuberculosis? Not necessarily, for he has in the preceding years of his illness probably done all the harm that he is likely to do in his particular environment. In other words, the criteria for isolating the hopeless case must be derived from his past and his human and social surroundings, as well as from the condition of his lung. Since young children are more susceptible than adults, they should be protected. This is not infrequently done more efficiently by removing the children instead of the dying patient. It is impossible to put down hard and fast rules regarding isolation; each case must be studied with full awareness of the socio-economic implications. The open case in a well-to-do household, in which there is an understanding of the hygienic necessities, is probably no menace.

How are the hospital beds actually used? Do they produce the maximum good for the maximum number of people—patients and their relatives? I think not. The tuberculosis wards are crowded with patients who are neither in need of nor able to profit from the specific care that the hospital is prepared to give and that neither clinic nor private physician can provide; they are crowded with patients, who—had they half-way adequate home surroundings—could and should be cared for by their private physicians.

Instead, modern hospital facilities should be used for the patient presenting a difficult diagnostic problem, for the patient in whom collapse therapy procedures should be used or, at least, initiated. Patients should be sent to the hospital when thoracoplasty is a hopeful and rational procedure and not when it is the last refuge from practically certain failure. The avoidable and unavoidable complications, spontaneous pneumothorax, empyema, extrapulmonary tuberculosis, complicating nontuberculous disease, should all probably call for more frequent, and certainly for earlier hospital admission than is so often the case. There are three great agencies for

the treatment of the tuberculous the private physician, the clinic, the hospital They will be utilized to the best advantage only when the patients are distributed with a more purposeful understanding of the specific function that each has to perform

Pathogenesis

A brief outline of the typical pattern of development of tuberculosis should be helpful not only for a profounder understanding of the disease, but for correct therapeutic indications and prognosis and for the decision of where a given patient should be cared for I shall follow here essentially the statements in Diagnostic Standards of the National Tuberculosis Association, because they represent what may be called a majority opinion of experts Our knowledge in many essential details is too incomplete and uncertain to speak in an apodictic and final way

In our country, where bovine tuberculosis is practically eradicated and the bacteriological control of milk has reached a standard of high excellence and where, therefore, intestinal infection is extremely rare, the first infection with the tubercle bacillus occurs in the overwhelming majority of cases in the lungs

The focus produced in the pulmonary parenchyma by the first invading bacilli consists of a small tuberculosis pneumonia, which undergoes rapid caseation During this process, the regional lymph nodes in the hilum become infected by lymphatic drainage and there, too, the foci undergo caseation The most frequent development of the primary complex, consisting of parenchymal and lymph node foci, is encapsulation and calcification This entire process usually occurs without apparent signs and symptoms, but a few weeks following the primary infection, the tuberculin test becomes positive Whether or not the calcified remnants of the primary complex are roentgenologically demonstrable depends on fortuitous circumstances of localization and size In a small, but not exactly determined percentage of cases, particularly in young children intimately exposed to prolonged infection, the primary complex shows progression instead of healing The parenchymal pneumonic focus then becomes a lesion of considerable size and the hilar lymph nodes become large enough to be easily demonstrable roentgenologically In other cases,

the parenchymal focus heals and the lymph node process alone progresses If progression occurs, tubercle bacilli may spread by all available channels lymph stream, blood stream, bronchi In the latter event, at times initiated by rupture of massive caseous lymph nodes into a bronchus, caseous and cavernous pulmonary tuberculosis with hopeless prognosis may follow Blood stream infections, depending on their massiveness, may remain clinically silent, or—in the other extreme—may lead to generalized miliary tuberculosis

Numerically more important are the cases in which a small number of bacilli reach the blood stream from the primary lymph node foci, causing single or multiple lesions in the lungs, bones, kidneys and other organs Scattered hematogenous foci in the lungs, frequently in the upper thirds, may progress to frank open pulmonary tuberculosis, but more frequently they lead to fibrosis and calcifications to form apical scars, seen so often in later life These apical foci may, after varying periods of latency, break down and discharge bacilli into the bronchial tree and thus initiate the characteristic pulmonary tuberculosis of adult life Other mechanisms that may start this disease are inhalation of bacilli from the outside (exogenous reinfection), reactivation of the primary parenchymal focus, with a following discharge of bacilli, at best an extremely rare occurrence, rupture of a caseated lymph node, belonging to the primary complex, into a bronchus, causing a tuberculous aspiration pneumonia, bacilli from such a lymph node may by lymph and blood stream reach the lung and set up single or multiple foci It cannot be decided, in the present stage of our knowledge, which of these mechanisms occur most frequently, but, regardless of how the bacilli reach the lung, the result is usually one, and more rarely, several pneumonic foci If single and seen at a really early stage, such a focus is small, less than 3 cm in diameter, it is frequently localized in the subclavicular region or in the mid-lung field This focus is the so-called early infiltrate It is an unstable lesion which tends to progress or regress rapidly Absorption and fibrosis may leave a small fibrotic scar, caseation and liquefaction, an isolated, rather thin-walled cavity

Once a cavity is formed, intrabronchial spread by means of the bacilliferous exudate in the cavity is most likely to occur. New regions of the lungs become infected, new infiltrates are formed. Some may heal by fibrosis and absorption, some will progress and excavate. Bacilliferous sputum may carry the infection beyond the confines of the lungs to the larynx and to the intestines. The development of this chronic cavernous progressive pulmonary tuberculosis is punctuated by relatively acute periods of new invasions and excavations and by chronic processes of repair.

During the course of chronic pulmonary tuberculosis which, as was emphasized, is characterized by intrabronchial dissemination, hematogenous spread may occur. It may involve only the lungs and complicate both the picture and the prognosis of the original disease, it may produce extrapulmonary foci in bones, kidneys, genital organs, adrenals and meninges. It is, then, the mere accident of localization which will determine the issue. Mention should be made of pulmonary tuberculosis which is apparently due to hematogenous seeding only. Such cases show symmetrically disseminated more or less nodular lesions. These patients frequently exhibit an astounding discrepancy between the anatomical extent of their lesions and the extreme paucity of their symptoms.

Of course, pulmonary tuberculosis does not always show this relentless progression, interrupted by healing and quiescent phases. It may become arrested and heal at any phase. The early infiltrate may heal and its bearer may be left with unimpaired function. But once wide-spread lesions have formed, healing occurs only by fibrosis and its unavoidable sequence emphysema, reducing considerably the respiratory reserve. When in extensive lesions extensive collapse therapy becomes necessary, healing of the tuberculosis can still be achieved in an imposing percentage of patients, but it is healing with marked functional defect and, at times, healing must be

paid for with the crippling of the respiratory functions.

We should accentuate three main periods in the development of chronic pulmonary tuberculosis: (1) the early infiltrate (to find the case at this stage means early diagnosis, the patient may be asymptomatic, or have only slight, grippe-like symptoms, his prognosis is good, if promptly and thoroughly treated), (2) the isolated cavity without major spread of the disease in the homolateral lung and no spread in the contralateral lung (this patient, too, may be practically asymptomatic, or he may have considerable symptoms of fever, fatigue and some cough, his prognosis is fair if proper treatment—often collapse therapy—is started immediately), (3) far advanced cavernous bilateral disease (this patient always has symptoms, which he may dissimulate, his prognosis is poor, regardless of the type of treatment he receives, although a certain percentage is saved by modern collapse therapy).

In conclusion, we may crystallize the role and the duties of the private physician in the great scheme of anti-tuberculosis work as follows:

He must diagnose the disease and he must do it in the early phases by looking for it in those who do not suspect it.

He must decide, according to the pathological status of the patient and his socioeconomic situation, whether to treat the patient at home, send him to a specialist, to the clinic or to a hospital.

He must educate the patient and his family, examine all his contacts, he must be the health officer for the tuberculous family.

He must be prepared to receive and advise the patient again, following the hospital phase of his treatment.

Editor's Note—This paper will be followed in the April issue by Dr. Edgar Mayer's presentation of Diagnosis and Treatment, as they affect the general practitioner.

Familial Spontaneous Pneumothorax and Other Spontaneous Pneumothorax

HENRY BACHMANN, M D
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A man is walking in the street Suddenly he stops He grips his side with both hands He has a look of extreme distress His mouth is open but he cannot get his breath A deadly pallor spreads over his face

Isn't this the typical history of a heart attack? Yes, it is But it might equally well be a case of spontaneous pneumothorax

The surgical type of spontaneous pneumothorax, i.e. the pneumothorax which happens quite frequently in the course of pneumothorax treatment, paracentesis and other surgical procedures on the chest, has met with careful attention in the medical and surgical text-books The non-surgical type, however, is only superficially mentioned Yet, its incidence is quite frequent, its symptoms are important from a diagnostic point of view, its treatment is well determined and may require urgent intervention

The non-surgical spontaneous pneumothorax occurs most often in children and young adults It may be caused by any abnormal condition of the lung, the pleura or the mediastinal organs — ("symptomatic type") In the newborn, the majority of cases show some kind of congenital malformation of the lung Among children the prevailing cause is pneumonia, among adults it is tuberculosis In a large group of cases, however, no evidence of any underlying disease can be detected—("Idiopathic type") In the past some minimal pathology of the lung or pleura was supposed to exist in these patients and for lack of evidence a minimal tuberculous infiltration or scar was inferred Recently, however, it has been proven on the basis of pathological studies, x-ray check-ups and critical evaluation of the clinical course that there is quite a large number of true idiopathic cases

Various theories have been propounded regarding the pathogenesis of the non-surgical pneumothorax In part of the cases there is undoubtedly a gross pathology of the pleura

and of the underlying tissues, or there is a small cortical abscess, in which a true rupture of the diseased area occurs But in a large number of patients such gross pathology is missing In these latter cases an air vesicle on the lung surface ruptures after being distended by a valve-like mechanism There are two kinds of valve vesicles, the one caused by local emphysema, the other one resulting from a surface scar secondary to a healed infection¹⁰ A contributing factor in the pathogenesis is a so-called "constitutionally weak pleura," which represents a "locus minoris resistentiae" Finally, a primary empyema may break through from the pleural space into the lung and, of course, any kind of chest trauma may cause a spontaneous pneumothorax

In the event of complete pneumothorax the collapsed lung is retracted along the spinal margin If adhesions prevent the lung from total collapse we find various types of selective pneumothorax The left side is somewhat more frequently affected than the right The perforation is most often located in the upper lobes It may be hardly visible to the eye, or it may be as large as a dime It may readily heal over and it may be covered with fibrin and not be detected at all

Sometimes, the pneumothorax is preceded by some kind of mechanical strain Very often, however, the causative action, if existing at all, is a trivial one

The occurrence of a spontaneous pneumothorax may not be noted at all and may be detected incidentally, or its symptoms may gradually develop over a long period of time, or it may strike suddenly with a severe attack The most common symptom is pain which involves the entire side of the chest or which may be located substernally or in the shoulder or in the back A very common feature is a marked heart consciousness, which is mostly associated with great anxiety and restlessness Dyspnea of varying degree is common It may be severe at the onset and gradually decrease, or it may develop slowly If there is

* Rocky Glen Sanatorium

an underlying lung disease the pre-existing dyspnea may grow much worse. Usually, there is marked pallor. Cyanosis as well as a sudden rise in temperature is quite frequent in children, but both are exceptions in adults. The pulse rate is always very high. Cough is frequent, but not constant and mostly of a dry, unproductive type. In extremely severe cases, syncope and general collapse supervene and a subnormal temperature may be found.

The physical findings in pneumothorax are many and variable. The affected side of the chest is increased in size, the interspaces are widened and bulging, the chest movements are limited, the apical heart beat is deviated or completely absent. Palpation reveals a typical elastic sensation over the interspaces—"air-cushion" sensation. The percussion produces the hyper-resonant, more rarely the tympanic, tone. Absence of respiratory mobility of the lower lung margin is noted and the limits of dullness of the neighboring organs are displaced. On auscultation the breath sounds are usually absent. Sometimes, however, tinkling rales or amphoric breathing may be heard. Pectoriloquy has a metallic note and the sign of the coin is positive. Vocal fremitus is diminished or absent. Effusions show the typical dullness in the lower part of the chest. The heart sounds are fast, but regular, unless there is an accompanying cardiac disorder. X-ray examination and aspiration of air after paracentesis prove the diagnosis.

The course of a spontaneous pneumothorax depends upon the type of the perforation. If it is pervious in both ways, as is the rule, and the patient does not immediately die in shock or collapse, the pneumothorax becomes stationary as soon as enough air has entered the pleural cavity to overcome the negative pressure. In part of the cases the opening is sealed over almost instantaneously—"closed pneumothorax") and the lung expands by absorption of the air within a few days or weeks. At other times the opening has less tendency to close ("open pneumothorax") The collapse remains stationary for various periods of time and the re-expansion takes place very slowly. In exceptional cases the pneumothorax has persisted for life.

The displacement of neighboring organs is greatest in the closed type especially when

an effusion supervenes which increases the positive intrapleural pressure. But even in open pneumothorax, in which the intrapleural pressure on the effected side is neutral and on the opposite side negative, the displacement may be considerable.

If the perforation is pervious only in one direction, we deal with the "valvular or tension" pneumothorax which is rather an exception. During inspiration air passes into the pleural cavity, but during expiration no exit of air is possible. The lung becomes more and more compressed far beyond the neutral point and the symptoms rapidly increase in severity. Unless immediate relief is given death occurs within a short time by circulatory failure or by anoxemia. Under exceptional conditions this type of pneumothorax is self-limited, the intrapleural pressure grows so high that the perforation becomes occluded even during inspiration.

The idiopathic pneumothorax has very few complications. Sometimes, there is a minimal effusion in the costodiaphragmatic angle, which is generally absorbed. Characteristic of the idiopathic cases is a marked tendency to recur. As many as 15 consecutive collapses may occur in one patient.

The symptomatic pneumothorax may not be any more serious than the idiopathic type. The cases caused by the rupture of an emphysematous bleb are quite benign. Part of this group, however, shows more serious complications. A hydropneumothorax is frequent and even a pyopneumothorax is not unusual. The latter occurs mainly following the rupture of a subpleural abscess and is most always fatal, especially in young children. Other serious though uncommon complications are haemopneumothorax and subcutaneous emphysema.

The acute stage of a lung collapse must not be confused with a heart attack. The differential diagnosis is not difficult "if one only thinks of the possibility of pneumothorax". Other chances of error are pulmonary conditions, such as capillary bronchitis, pulmonary edema, bronchopneumonia and miliary tuberculosis. Furthermore, congenital absence of a lung, congenital cysts, a diaphragmatic hernia, pneumoperitoneum and large emphysematous bullae may simulate a spontaneous pneumothorax.

On the x-ray picture a large peripheral cavity and a selective collapse may look identical and the diagnosis may be difficult. A cavity is more often apical, a pneumothorax more often in the lower part of the chest. The chest wall over cavities is usually retracted, over pneumothorax it is bulging. The vocal fremitus over cavities is usually increased and over pneumothorax pockets decreased. Pneumothorax may cause displacement of the mediastinum to the opposite side, cavities do not. Otherwise, the differential diagnosis is made from the course of the condition.

Regarding the treatment three different groups are to be considered. The pervious type of pneumothorax usually requires only a symptomatic treatment: immediate rest in half-sitting position, strapping of the chest, small doses of opiates, barbiturates. The administration of oxygen may be needed to relieve marked dyspnea. The positive pressure effected by the use of an oxygen mask or catheter may facilitate a rapid expansion of the lung. For a few weeks the patient should not do any heavy work. Slowly, he may then be rehabilitated.

Because of the recurrent character of the idiopathic pneumothorax, preventive treatment is imperative in those patients who have had more than one attack. Pleural adhesions should be obtained at any price. Various irritating solutions have been used to this end: saline solution, sterile mineral oil, 300 cc of the patient's own blood, a 5 per cent silver nitrate solution, small amounts of hypertonic glucose solution and so forth. Even suture of the perforated lung area to the chest wall has been resorted to. The results have been satisfactory in some of the cases and disappointing in others. A much recommended method is to continue the pneumothorax by gas refills over a period of possibly 6 to 9 months. It is well known that pneumothorax treatment alters the epithelial lining of the pleura and, after the final re-expansion, adhesion of the pleural layers generally occurs.

In the valvular type of pneumothorax immediate intervention is life saving. Decompression by paracentesis and suction must be done speedily. Reversing the bottles of a pneumothorax apparatus serves this purpose very well, but in case of emergency a large

syringe may be used. If the suction has to be continued for hours a water pump may be connected with the paracentesis needle. In this group the supplementary administration of oxygen often helps the patient over the critical period. Cardiac and circulatory drugs are needed as auxiliaries.

Complications require appropriate procedures, aspiration in hydrothorax, aspiration, drainage or operation in pyopneumothorax.

The non-surgical spontaneous pneumothorax may be bilateral. The so-called "simultaneous type" is extremely rare, the "successive type" is not infrequent.¹⁶ About 58 per cent of the bilateral cases occur in patients with active or healed pulmonary tuberculosis, about 16 per cent are supposed to be a sequel to emphysema. Besides there are quite a few idiopathic cases, whose characteristic feature is an alternating recurrence. In the case of idiopathic bilateral pneumothorax the theory of a congenital predisposition of the pleura ("a weak pleura") is most convincing. Another theory advocates the leakage of gas through an orifice in the mediastinum from one side to the other. There are, however, only a few cases of tuberculosis and traumatism in which such a theory is workable.

The symptoms of the bilateral pneumothorax do not differ from those of the unilateral type. Yet, the physician may be puzzled when he examines a patient with a previous pneumothorax on one side, who has had another identical attack. He may not find any physical signs of pneumothorax on the same side. However, if he thinks of examining the opposite side, he may discover a contralateral collapse.

The course of the bilateral pneumothorax is identical to that of the unilateral type. The symptomatic and especially the tuberculous cases have rather a poor prognosis. The idiopathic cases generally have a favorable one.

The treatment does not differ from that in the unilateral pneumothorax. In the recurrent type, in which pneumothorax refills are indicated, it is best to keep first one side collapsed and after re-expansion and formation of adhesions on this side, to proceed with the same treatment on the opposite side.

Case Report

Mr J A, age 45, businessman, family history negative for tuberculosis, had no previous diseases of the chest

About one year ago, while opening a window, he had an attack of sharp pain in his right chest. Shortness of breath and heart consciousness soon developed. He dragged himself to the telephone and called a doctor, who had him taken to a hospital. There, a diagnosis of spontaneous collapse of the lung was made and confirmed roentgenographically. The attack persisted for a few hours and some shortness of breath, some soreness of the chest wall and occasional sharp pains continued for weeks. After four weeks of bedrest the symptoms had entirely subsided and an x-ray check-up after eight weeks showed the lung completely re-expanded. The reading of this latter x-ray picture showed "complete re-expansion of the lung, no evidence of tuberculosis, no residual findings of pathology." No relapse has occurred so far. However, the patient tells that he had a similar attack about five years ago. At that time he was taken with acute pain in his side. His doctor told him he had pleurisy and ordered bed rest. After a few days of rest he was able to return to his normal routine. No x-ray picture was taken.

Five months ago, Mr J A's daughter, Miss M A, age 18, had a similar attack while riding on the train. She was taken to a hospital and an x-ray picture confirmed the diagnosis of spontaneous pneumothorax. After two months of bed rest the patient had completely recovered and x-ray check-up revealed complete re-expansion of the lung. No signs of tuberculosis or of any other lung pathology were detected. No relapse has occurred within the last three months. This patient had two similar attacks during the two years previous to the reported illness. These attacks, however, were very light and no check-up was made as to their true nature.

As far as I have been able to ascertain, there has not been any previous report of a familial occurrence of spontaneous collapse of the lung. These two cases suggest that hereditary factors may play an important part in the pathogenesis of the idiopathic type of spontaneous pneumothorax.

Summary

A description of pathogenesis, pathology, symptoms, signs, differential diagnosis, course and treatment of the non-surgical, unilateral and bilateral spontaneous pneumothorax and report of two cases of the idiopathic type occurring in father and daughter of one family were presented.

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Contagious Technique in Caring for Tuberculosis by Hospital and Sanatorium Employees

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The question of the hazard of an employee caring for tuberculous patients varies for the following reasons

1 The type of patient, particularly as to intelligence and stage of disease

2 Age, intelligence, mental alertness and dependability of an employee in caring for an infectious disease

3 Contagious technique procedure

It is no longer true that there is universal infection with the tubercle bacilli by the age of 15 years. In this country, about 30 per cent of our young student nurses give evidence of negative tuberculin reactions, but on graduation we find that as many as 80-100 per cent have acquired positive tuberculin tests, unless contagious technique is practiced. This leads us to the all important subject of how to protect our employees, student nurses, internes and others who work in general hospitals and sanatoria.

In Bret Harte Sanatorium, we do not practice a strict contagious technique, but our procedure with the student nurses at the general hospital differs from that of the sanatorium. Student nurses are tuberculin tested* before acceptance, the negatives are retested every six months, the positives x-rayed annually. Students do not serve in tuberculosis wards. We believe, at the general hospital, that a more strict contagious technique should be instituted as follows. The school of nursing should require students to master and understand contagious technique in the very earliest part of their training, because the greatest risk is in the general admitting service, in caring for the unknown tuberculous patient, who has had no training in caring for his sputum and personal hygiene, rather than in the tuberculosis ward. This is in disagreement with those who are of the opinion that nurses in the tuberculosis service more frequently develop tuberculosis than

those in the general hospital where all sorts of patients are admitted and where many unsuspected cases (15 to 7 per cent) are responsible for nurses becoming infected. A number of suggestions have been made by various authorities with the thought of reaching some solution in the protection of employees. One suggestion was made that older student nurses be permitted to take tuberculosis service and that only older graduate nurses be employed in sanatoria and in the tuberculosis service of the general hospital. True, a positive tuberculin test is desirable, possibly from the employer's liability standpoint.

More recent observations have shown that the human body may become infected with the tubercle bacilli whenever it is exposed, whether in infancy, senility, or at any intervening time. In fact, it has been known for some time that there is more tuberculosis in the 3rd and 4th decades of life than in the 2nd, therefore, we have no evidence that the assigning of employees of over 25 years to the tuberculosis units would in any way solve the problem.

A second suggestion has been made that we admit to the schools of nursing only those whose reaction to the tuberculin test is positive. In this respect, we have reports from Denmark, where they vaccinate all their employees with BCG, securing positive tuberculin tests prior to employment and, according to their reports, they have a smaller incidence of open tuberculosis in this group. However, we feel that there is no difference between this group and the one first mentioned, the remote hazards are identical.

The third group believes it is better for students to become contaminated with the tuberculosis bacilli in the hospital or sanatorium where they can be observed and given good care. This argument is fallacious from our point of view.

Fourth, it is as good for the student per-

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sonnel to contract their first infection type tuberculosis on duty, on special tuberculosis service, because of the small dosages they receive. We cannot agree with such conclusions.

Fifth, that it is well for the employee, student nurse, or interne, to become infected with the tubercle bacilli, as such infection affords adequate immunity. This, too, we believe is untrue.

Sixth, that employees and non-professional members of the hospital personnel must sooner or later become infected, therefore, the sooner the better. This, we think, is not based on sound reasoning.

The following technique is used at Bret Harte Sanatorium.

Nurses, as well as all employees, wear smocks in the wards. Gowns are worn over uniforms at all times in the wards, and are not worn out of the wards. Masks are also worn while making beds, handling linens and laundry and also at such times as respiratory infections are present. Meticulous care is taken to see that the hands are washed frequently after caring for each individual patient, before serving diets, before pouring and administering medication, before charting, before leaving the ward and before the nurse's own meals. Hands should be kept away from the face AT ALL TIMES before cleansing. The patient's face basin and emesis basin are washed with soap and water, and boiled after use. For the bed-ridden helpless patient, whose sputum is teeming with acid-fast bacilli, the same technique is carried out, but an endeavor is made to group these patients and, it is true, they frequently require more intimate bedside care. However, we think, at the sanatorium, that the above technique is practical and adequate in both instances. These procedures can be carried out in the general hospital as well as the sanatorium, except that the smock should be changed, as well as the hands cleansed, on leaving such a patient or group of patients to care for others. Soap and water, air and sunshine are the principle agents used in the care of walls and floors of cubicles, rooms, and furniture, such as table, stand, and bed. Three pillows are issued to each patient. These are

his own property until he leaves the institution and when this occurs, the pillows and mattresses are cleaned with the vacuum and then sunned. Blankets and bed linen are sent to the laundry and handled by as few people as possible.

In an ideal set-up, each patient is provided with a thermometer which may be kept at the bedside in 70 per cent alcohol solution. If individual thermometer technique is not possible, the ward thermometer must be washed in soap and water and soaked in alcohol or an antiseptic solution. Since tuberculosis is transmitted from person to person through the sputum, disposal is of first importance. Proper methods must be thoroughly understood by the nurse and taught to the patient so that he will not be a menace to others when he again takes his place in the community. All of the nurse's efforts toward prevention may be wasted, if she fails in her duties as a health teacher.

The first measure that the patient is taught is to cover his mouth while coughing. Squares of soft paper tissues which may be destroyed after first use are appropriate. A paper bag fastened to the patient's bed or within easy reach is used for disposal. These bags are collected daily and burned. The sputum cup is collected twice daily or when half full. The paper liner or cup is removed from metal holder with forceps and placed on several layers of paper or in paper bags. The cup is filled with sawdust to absorb the moisture and insure complete burning. Without touching the cup with the hands, it is wrapped in paper and tied securely with string. It is then placed in a receptacle for burning. Ambulant patients are usually responsible for the care of their own sputum cups, under the supervision of the nurse.

To summarize, we must ever realize that tuberculosis is infectious, its infectiousness to human beings depending upon several variants, that there is no objection to strict contagious disease technique in the handling of tuberculosis patients. However, we feel that this is unnecessary and that modified technique is efficient, but that its efficiency depends upon the vigilance of a trained professional personnel, particularly the Superintendent of Nurses, with the cooperation of

other employees We also feel that these should be picked for their neatness, mental alertness, physical condition, age, and conscientious dependability Much also depends upon the type of patient, his mental capacity,

alertness, intelligence and his cooperation Conceding this, we feel that incidence of infection with modified contagious technique is no greater and possibly even less than in the general population

Early Diagnosis of Tuberculosis

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Tuberculosis, despite the knowledge and results obtained in the past fifty years, still remains one of our major problems in the field of medicine It is hoped that the following suggestions, many of which are based on an experience of some thirty-five years in this field, may be helpful

As it is not always easy to make a diagnosis of tuberculosis, and this paper deals with the pulmonary type only, the first requisite is, especially in obscure conditions, always to bear in mind the possibility of tuberculosis, even if for no other reason than to rule it out With careful attention to every detail, it is quite possible to make the diagnosis from symptoms alone, even before the physical signs are present It is well to remember that certain races seem prone to the disease, especially the Negro and the Chinese

The first requisite in the diagnosis is a carefully taken history, both family and personal A history of tuberculosis in the family, and especially of contact, is always important The home conditions cleanliness, ventilation, deficiency of sunlight, financial status, over work, both physical and mental, and occupation, have a bearing Attacks of fever, transitory in type, especially if attended by malaise, one or more attacks of pleurisy, repeated attacks of bronchitis, especially if unilateral, and frequent colds are always suspicious

The symptoms of early tuberculosis are indefinite and usually extend over a more or less protracted period The first warning may be the coughing up of blood, varying in quantity, and often following some form of exertion, such as running A slight cough, not always short or dry, with or without expectoration, may be the first warning, this may

be constant or intermittent Should there be expectoration, a sputum examination is indicated and should be repeated, as one examination, even if negative, does not necessarily rule out tuberculosis One should remember that it is possible to have tuberculosis even with a negative sputum There are disturbances of the circulation, with rapid pulse and pallor

A rectal temperature is usually more reliable than an oral one You may find catarrhal attacks starting as a cold in the head and working downward into the lungs, resulting in a bronchitis, with a more or less protracted course This tendency may exist for months before tuberculosis is suspected and the bacilli appear Such cases, especially when accompanied by a tuberculosis history, are most suspicious There may be pain over the affected area, either constant or intermittent, usually neuralgic or rheumatic in type, with a consequent diagnosis of neuralgia or rheumatism This pain is usually the result of a localized pleurisy and is considered diagnostic by some writers In this connection, it is always well to bear in mind the possibility of lung cancer Lung cancer is considerably more common than we have been led to believe in the past Whenever there is severe pain and dyspnoea, out of all proportion to the x-ray and physical findings in the chest, and it cannot be explained in any other way, cancer of the lung should be seriously considered, if for no other reason than to rule it out

The next step in importance is the type of breathing present, as there are depressions above or below the clavicle or clavicles The affected side lags on deep inspiration and expansion is restricted, ordinarily, a

limitation of excursion at the bases on the affected side can be noticed

After this follows percussion of the chest. In this connection, with practice, one can close his eyes and his ears and map out the impaired area, or areas, by the feeling under the finger. There is a resistance over the impaired area readily transmitted to the finger. Over affected areas the percussion note is duller and the resonance diminished, or in some instances slightly higher and with a tympanitic note.

The determination of the respiratory note is the next step. It may be the rough vesicular type, or it may be a weak vesicular type, or a combination of both. Rough respiration is the earliest sign and is present even before percussion reveals any evidence of change. Weak respiration comes next in importance. In this connection care should be exercised to eliminate nasal obstruction or the plugging of a bronchus. At times, the respiration is jerky—always a suspicious sign. It is only when we have contraction that we get a sharpened inspiration accompanied by a prolonged and sharpened expiration. The respiration may be loud or soft or a combination of the two. Diminished respiration at the apex, in the young, unless due to nasal obstruction or a plugged bronchus, means activity, in the adult, a healed lesion. Rales, if present, are usually heard in more or less advanced cases. In the early cases they consist of a simple click, at the extreme end of inspiration, or persistent fine crepitations, or they may even take the type of a sharp groan or whine. All these are constant and are heard at the end of inspiration or the beginning of expiration and on and after

cough. This rule may be safely followed, rales which on repeated examination are constantly to be heard and are limited to a definite area, are quite indicative of tuberculosis. Increased whispered voice heard over these areas is another important sign.

Sputum examinations, as mentioned earlier in this paper, repeated if necessary, are always indicated whenever there is expectoration, with or without cough. If this procedure is followed, many cases of tuberculosis will be detected early which otherwise might have gone on to a stage where recovery would be difficult or impossible.

X-rays of the chest are of valuable assistance and should always be made, if possible, as a routine procedure. In this connection may I say, that if one will discount his physical findings by at least a third, that is, if he will consider that there is a third more affected area in the chest than his physical findings reveal, he will check very closely, if not absolutely, with the x-ray. Otherwise, to his dismay, he will find the x-ray reveals considerably more involvement than was brought out on examination and, as a result, much more alarm accrues to the patient.

Tuberculin tests in doubtful cases are valuable adjuncts and for the best results, should be carried out only by those qualified in their use. All positive reactors should have a chest x-ray as well, since a tuberculin test tells one of the presence of tuberculosis somewhere in the body, but not always where.

In summary, the early diagnosis of tuberculosis can only be made from a careful correlation of all data obtainable by a meticulous examination and then only when so arranged that it spells TUBERCULOSIS.

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Book Review—Clinical Tuberculosis*

Edwin R Levine, M D**

Clinical Tuberculosis Edited by Benjamin Goldberg, M.D., Philadelphia F W Davis Co., 1939
2nd edition 2 Vols \$15 00

This is a new edition of a system which should be familiar to everyone interested in tuberculosis. For we might as well mention at the start, that this is the best book on the subject that is at present procurable.

The treatment and study of tuberculosis is considered to be a specialty. It is however a specialty that involves the entire body, includes both medical and surgical approaches, and enters research laboratories as well as public health offices. Its wide scope not only justifies but demands that a text on the subject be the collaboration of the ideas of many men. And that is the plan of these volumes, a collaboration of monographs on the various aspects of tuberculosis.

This new edition, coming so soon after the first, is evidence of the progressiveness that must be evidenced if a book or an individual, for that matter, wishes to keep abreast of the constant advances in this field. What was good enough five or ten years ago is hardly satisfactory now, even though certain fundamental concepts do not change.

Nowhere is this more true than in epidemiology and statistics. Year by year the incidence and death rate from tuberculosis are changed. Today the rates are markedly lowered. Some of the authors of articles in medical journals who discuss individual rates today by comparing them to a general rate, which is however, ten to twenty years old, should note the course of the statistics shown by Drolet in the chapter on Epidemiology.

We might make the same suggestion as regards Jaffe's splendid chapter on Pathology, and Carryllos' discussion of Pathogenic Physiology. Although the subject of pathogenesis of tuberculosis still has many an unsolved problem and many a debatable concept, there does not seem to be any justification for the confusion which exists in the literature. It was a relief to read a clean cut scientific statement of pathology and pathogenesis based on the facts instead of supposition. Of the section on Physiology, we may simply say that it should be required reading for all men who deal with pulmonary diseases, especially those interested in therapy.

Most of the sections dealing with fundamental knowledge of tuberculosis have been little

changed. There are the excellent chapters on diagnosis by physical, laboratory and x-ray methods that were found in the earlier edition. To the chapter on classification has been added a section on Endobronchial Tuberculosis, a subject that has been the center of much interest and discussion in recent years. Formerly it was overlooked entirely while today there is perhaps too much emphasis on tuberculosis of the bronchi especially as regards treatment.

Another section which bears mention is that dealing with collapse therapy and chest surgery. In the modern treatment of tuberculosis, collapse is almost indispensable for those cases that require active treatment, and surgery has developed from a desperate remedy to an everyday procedure. No book could be considered complete unless this aspect of treatment was also fairly completely covered.

The chapters dealing with the various phases of collapse therapy are both complete and intelligible. There are good discussions of pneumothorax and thoracoplasty. One may look in vain for some of the procedures which are enjoying something of a vogue at present in some quarters, but it would seem logical to include only such measures as have been judged by clinical experience for a sufficient period. It would be manifestly impossible to include all ideas, suggestions, and treatments that are found everywhere in such profusion, nor would it be in any way desirable.

As for the complications and the extrapulmonary lesions, these are subjects of many chapters in the latter section of the book. These are the aspects of tuberculosis which are often seen in general hospitals. Because of this fact they are frequently handled by men whose knowledge and experience in tuberculosis are rather meager. And as every surgeon, laryngologist and urologist knows, the approach to a tuberculous condition varies in many ways from the approach to any other.

These chapters which deal with extrapulmonary conditions, may well serve as a reference book for those who come in contact with tuberculosis only occasionally. In fact, it should be found in the library of every general hospital and should be looked into as the need arises.

There is one chapter which is entirely new, that on Tuberculosis in Industry, by Ornstein and Ulmar. This subject has taken on more importance as compensation and liability laws have been widened.

Once again a great deal of confusion has occurred in the discussions on tuberculosis as an occupational disease and on the questions of silicosis and of trauma. Much of this confusion

* Editor's Note —Because this review is so comprehensive and because it expresses our views completely, we are reprinting it in toto from the January, 1940, Vol V, No 2, issue of *The Quarterly Bulletin of Sea View Hospital*.

** Editor *The Quarterly Bulletin of Sea View Hospital*.

would be eliminated, if the concepts were first checked against fundamental knowledge of pathology and pathogenesis. This chapter clarifies the subject, simplifies the discussion and never wanders from known and accepted ideas of pathogenesis. It is worth reading and perhaps re-reading when asked for an opinion on an industrial case.

We have made no attempt to analyze each individual part of the book. It seemed better to pick out certain sections for mention, sections which are the most vital parts of any such work.

We should perhaps speak of the numerous illustrations which are reproduced in a manner that makes it possible to see the point illustrated. That is a matter of some importance.

This is a two volume set that belongs in every medical library. We shall repeat what we said in the beginning, that this is the finest work procurable at the present time on the subject of tuberculosis and as such we shall continue to recommend it to those who are looking for a good book on the subject.

New Case-Finding Method

Abstract of Report

Development of a reasonably accurate yet relatively inexpensive method of applying x-ray examination to large groups of people in tuberculosis case finding was described in a paper delivered before the Radiological Society of North America at its Atlanta meeting. Authors of the paper were Drs. Hollis E. Potter, of Chicago, and Bruce H. Douglas and Carl C. Birkelo, of Detroit.

Reporting on a study of 1610 cases, on which both regular 14-inch x 17-inch radiographs and 4-inch x 5-inch photographs of the fluorescent image were made for comparative diagnosis, their method of photo-roentgenography was characterized as a "type of examination which can be applied to large numbers rapidly and economically," having "definite advantages over certain other x-ray methods," which "can be applied directly without preliminary tuberculin testing," and which "offers a practical method for case finding in tuberculosis for use in surveying large numbers of susceptible groups."

After giving recognition to the work previously carried on by others in an effort to achieve a similar objective, the authors pointed out that Dr. Potter, in consultation with the General Electric X-Ray Corporation laboratories, after much study and experimentation arrived at the conclusion that the most desirable objective in photography of the fluorescent image should be to produce a small film, small enough to make a real economy in its use, and yet large enough to be readily interpreted without enlargement, or at least no greater enlargement than that provided with a simple reading glass.

Working on this basis it was found that a 4-inch x 5-inch film with an effective focal range slightly smaller than this would answer the requirements. Special equipment was therefore designed by the General Electric X-Ray Corp. for producing such photo-roentgenographs, according to the discussion.

The technique of producing this film requires a

modern x-ray installation with capacity to permit exposures of from 20 to 80 milliamperes-seconds at from 60 to 80 kilovolts, an impulse timer, and a tube-screen distance of 50 inches or 125 centimeters—thus producing as little distortion as possible.

The fluorescent screen used is nearly seven and the lens is also a specially prepared instrument with a rating of F15, and is mounted in a tunnel with the screen at the opposite end so that both can be moved up and down to adjust to the proper level for a patient standing upright. This lens is capable of producing a very sharp image in an area of about 3.7 inches in diameter on the 4 x 5 film.

"In order to test the capacity of this 4 x 5 film, which is called miniature film," the essayists pointed out, "it was decided to examine a large number of patients with both the regular 14 x 17 size film as well as with the miniature film, both films to be taken at the same visit of the patient to the x-ray department. The regular film represents as nearly as possible the most up-to-date technique. It is taken at 72 inches tube-film distance, using a rotating anode tube, 400 ma., and from 60 to 75 kv., and the time on an impulse timer varies from 1/40 to 1/20 second depending on the thickness of the patient's chest from actual measurements with calipers. 1610 cases were so examined and an interpretation of the miniature film was always made and recorded independently, and before a similar record of findings was made from the regular film, because the regular film was the standard by which the efficiency of the miniature film must be measured."

"Two hundred and seventy-one patients had active tuberculosis and they include the primary type with lymph node enlargement, wet pleurisy, and minimal, moderately and far advanced cases. This is the group which was of primary interest and five of the minimal lesions were missed in the interpretation of the miniature films. Two

other minimal lesions were called healed primary. All of these lesions are very small and might easily be missed in a regular film taken at a different angle, a slightly different depth of breathing, or with less perfect technique. In nearly every instance these lesions, which were missed, were superimposed by rib shadows in the miniature and not obscured in the regular film.

"Granted that there were five completely missed lesions and two others called healed primary, making a total of seven missed out of 271 active lesions, there is an error of 2.6 per cent."

On the basis of careful calculations and actual records it was estimated that the cost of materials only for 4 x 5 photo-roentgen films was about one-tenth that for regular 14 x 17 radiographs of the chest.

Comparing the new method with other means of group survey work, Drs Potter, Douglas, and Birkelo pointed out that, in common with other x-ray methods, it requires only one visit by the patient while several may be needed for complete

tuberculin testing, results in a permanent record, is more acceptable to patients, and provides a means of detecting other non-tuberculous lesions of the heart and lungs. It is more economical than the use of full size radiographs and more accurate than fluoroscopy alone, they suggested. Considering the even smaller 35-mm film, they declared that while these micro-films are quite inexpensive to produce, they are in the opinion of many, too small. 35-mm films must be enlarged either by projection or printing in order to interpret and in this enlargement considerable detail is lost, they said.

"While the 35-mm method has not yet been subjected to careful comparison for accuracy with full size film and with 4 x 5 film, some observation of its use suggests that too much has been sacrificed in accuracy in favor of economy, which is not true of 4-inch x 5-inch film", they concluded.

—General Electric X-Ray Corporation

Organization News

SCIENTIFIC PROGRAM COMMITTEE FOR SIXTH ANNUAL MEETING OF THE COLLEGE REPORTS

Outstanding Speakers Will Present Papers

Dr George Ornstein, New York City, Chairman of the Scientific Program Committee for the Sixth Annual Meeting of the American College of Chest Physicians to be held at the Biltmore Hotel, New York City, June 8-10, 1940 announces that the following speakers will appear on the program.

Saturday, June 8th, 9 00 a m.

Dr Foster Murray, Brooklyn, N Y, Chairman

Dr Walter C Hausheer, Newark, New Jersey "Chronic Pulmonary Diseases from the Insurance Point of View"

Dr John N Hayes, Saranac Lake, N Y "The Indications of Voluntarily Discontinuing Pneumothorax Treatment"

Dr Herbert R Edwards, New York, N Y "Case Finding—A Fundamental in Tuberculosis Control"

Dr Richard H Overholt, Boston, Massachusetts "Extrapleural Pneumothorax: A Report of Experiences and Present Day Indications"

Saturday, June 8th, 2 00 p m

Drs Israel G Epstein, Myron Herman, and Henry Green, Brooklyn, N Y "The Correlation Between Tomographic Studies of the Lung and

the Necropsy Findings, Both Studies Done Shortly After Death"

Dr Andrew L Banyal, Wauwatosa, Wisconsin "Newer Aspects of the Pneumoperitoneum Treatment of Pulmonary Tuberculosis"

Dr D Matsuzawa, Staten Island, New York "Diagnosis of Bronchopleural Fistula in Tuberculous Empyema"

Dr Louis H Clerf, Philadelphia, Pa "Bronchoscopy in Bronchial Obstruction"

Sunday, June 9th, 2 p m

Dr David Ulmar, New York, N Y, Chairman

Dr William F Reinhoff, Jr, Baltimore, Md "Surgical Management of Carcinoma of the Lung"

Drs Harold Brunn and Sidney Shipman, San Francisco, Calif "Certain Aspects of Intrapulmonary Cavitation"

Dr Harold Neuhoef, New York, N Y "Surgical Treatment of Acute Pulmonary Abscess"

Dr Louis R Davidson, New York, N Y "Surgical Treatment of Mixed Infection, Tuberculous Empyema"

Monday, June 10th

Dr Edward P Eglee, New York, N Y, Chairman

A number of clinics will be held in the tuber-

culosis hospitals throughout the city. The subjects to be presented at these clinics will be announced later.

"Information Please" Luncheons

A novel method for conducting a question and answer period will be inaugurated this year at the College luncheons. Two such sessions have been planned by the program committee. The first of these luncheons will be held on Saturday, June 8th, and the second one will be on Sunday, June 9th.

Seated at the speakers' table will be a bacteriologist, a surgeon, a radiologist and a phthisiologist. Questions directed to these experts will come from the floor and they will be interrogated by the chairman, Dr. Edward P. Eglee, who will receive the questions.

"Information Please" should prove an interesting method for bringing out pertinent information concerning our specialty.

In view of the fact that a large attendance is expected, it is advisable that reservations for these luncheons be made early. Please write at once to the Executive Secretary of the College, P. O. Box 1069, El Paso, Texas, for reservations.

The names of the physicians who are to discuss the papers on the program will be announced at a later date. Watch for the completed program in these columns.

PROGRAM COMMITTEE RECEIVES CONGRATULATIONS

The officers of the American College of Chest Physicians congratulate the chairman and the members of the Scientific Program Committee for the very excellent program which they have arranged for the 1940 meeting. It is refreshing to note that each of the subjects are of current interest. The newest happenings in pathology, diagnosis and treatment of chest diseases are to be presented at this meeting and we trust that every fellow of the College will make it a point to attend the meeting. Write to the Executive Secretary of the College today for your reservations.

SIXTH ANNUAL MEETING

*Biltmore Hotel, New York City
June 8-10, 1940*

Scientific Program Committee—George Ornstein, M.D., New York, N. Y., General Chairman

Medical Section—Foster Murray, M.D., Brooklyn, N. Y., Chairman, James S. Edlin, M.D., New York, N. Y., Raphael Bendove, M.D., New York, N. Y., Barnett P. Stivelman, M.D., New York, N. Y.

Surgical Section—David Ulmar, M.D., New York, N. Y., Chairman, Nagla M. LaF. Loofy, M.D., Brook-

lyn, N. Y., George A. Lassman, M.D., New York, N. Y., Stanley L. Wang, M.D., New York, N. Y.

Clinical Section—Edward P. Eglee, M.D., New York, N. Y., Chairman, Henry L. Dorfman, M.D., New York, N. Y., Maurice Kovnat, M.D., Staten Island, N. Y., Eli H. Rubin, M.D., Bronx, N. Y.

Entertainment Committee—James S. Edlin, M.D., New York, N. Y., Chairman, Alice D. Weber, M.D., New York, N. Y., Vice-Chairman, Sydney Bassin, M.D., New York, N. Y., Julius P. Dworetzky, M.D., Liberty, N. Y., Irving I. Sarot, M.D., New York, N. Y., Chas. W. Rieber, M.D., Forest Hills, N. Y., Emanuel Singer, M.D., New York, N. Y., Harry St. John Williams, M.D., Poughkeepsie, N. Y., Morris Tannenbaum, M.D., Bronx, N. Y.

General Arrangements Committee—Edgar Mayer, M.D., New York, N. Y., Chairman, Harry Golembe, M.D., Liberty, N. Y., Vice-Chairman, Willard J. Davies, M.D., Rockville Center, N. Y., George Foster Herben, M.D., Yonkers, N. Y., Israel Kaufman, M.D., Brooklyn, N. Y., Edwin P. Kolb, M.D., Holtsville, N. Y., A. A. Leonifoff, M.D., Poughkeepsie, N. Y., John M. Nicklas, M.D., Valhalla, N. Y., Clarence A. Read, M.D., New Rochelle, N. Y.

FELLOWS OF THE COLLEGE HOLD MEETING AT TUCSON

The Fellows of the American College of Chest Physicians held a meeting at the Santa Rita Hotel, Tucson, Arizona, February 16th. Murray Kornfeld, Executive Secretary of the College, addressed the meeting. He spoke on the progress made by the College and the present and future program of the College. Dr. Chas. S. Kibler, Governor of the College for Arizona, presided at the meeting. A telegram from Dr. Frank Walton Burge, Philadelphia, Chairman of the Board of Regents, was read by the chairman, urging a good attendance of the Tucson Fellows at the New York meeting to be held June 8-10th.

ELECTED TO OFFICE FOR THE ATLANTA TUBERCULOSIS ASSOCIATION

Dr. Champ H. Holmes, Atlanta, Georgia, former President of The American College of Chest Physicians, and Chairman of the Committee for the Advancement of Scientific Programs in Organized Medicine, has been elected President of the Atlanta Tuberculosis Association. Dr. A. Worth Hobby, also a Fellow of the College, was elected Chairman of the Association's Medical Staff.

Dr. I. D. Bobrowitz, Otisville, New York, a Fellow of the College, is now Medical Superintendent for the Municipal Sanatorium of the City of New York at Otisville.

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CONTRACT LET FOR TUBERCULOSIS HOSPITAL

Construction work on a \$60,000 tuberculosis ward for the City-County Hospital of El Paso was begun in February. The ward will be for the use of indigent patients

Durham County Drs D T Smith, D R Perry, Hunter Sweany, Durham

Buncombe County Drs Wilson Pendleton, Julian Moore, J W Huston

FELLOWS PRESENT AT MEETING

Present at the Annual meeting of the Tuberculosis and Public Health Association of Louisiana, held in Monroe, on January 30th and 31st, were Doctor Paul Turner, Fellow of the College, who addressed the meeting, the title of his paper being, "Let's Take Stock", Dr Julius L Wilson, of New Orleans, Regent of the College for District Number 8, and Doctors W S Conklin and Charles R Gowen, both Fellows of the College and both of Shreveport

FELLOWS OF THE COLLEGE AT SAN DIEGO MEET

The Fellows of the American College of Chest Physicians of San Diego, California, met at Hotel El Cortez, San Diego, on February 21st. The meeting was addressed by Murray Kornfeld, Executive Secretary of the College, who spoke on the accomplishments of the College to date and its future program. Dr Stephen A Parowski was the chairman of the meeting

TEXAS TUBERCULOSIS ASSOCIATION TO MEET

The thirty-first annual meeting of the Texas Tuberculosis Association will be held in Corpus Christi, Texas, April 11, 12, and 13, 1940, with headquarters at the Nueces Hotel. Among those on the program will be the following Fellows of the College: Dr Donato G Alcaron, Mexico City, D F, Dr C J Koerth, San Antonio, Texas, Dr R G McCorkle, San Antonio, Texas, Dr Sim Hulse, Ft Worth, Texas, and Dr F N Moore, Austin, Texas

DR GOLDBERG ADDRESSES FELLOWS OF COLLEGE AT PHOENIX

Dr Benjamin Goldberg, Chicago, Illinois, First Vice-President of the American College of Chest Physicians addressed the Fellows of the College at Phoenix, Arizona. Dr Goldberg spoke on the progress of the College and the advancement of tuberculosis organization within medicine. Dr Goldberg is the chairman of the committee supervising the organization of tuberculosis committees in the state and county medical societies under the Pennsylvania Plan as adopted by the College. Dr Victor S Randolph, Phoenix, Arizona, Regent of the College, was chairman of the meeting

COUNTY TUBERCULOSIS COMMITTEES FORMED

Doctor S M Bittinger, Chairman of the North Carolina State Tuberculosis Committee, reports through Dr Karl Schaffle, Governor of the College of the State of North Carolina, that County Tuberculosis Committees have been organized, as follows

Robeson County Drs Holmes, Flarmon, Fred Nash, St Pauls, Robert Croom, Maxton

Iredell-Alexander Counties Drs Dwight Myers, Harmony, Charles B Herman, Statesville, C L Bittinger, Mooresville

Forsyth County Drs F D Craig, J P Davis, P A Yoder, Winston-Salem

New Hanover County Drs J C Wessell, R B Rodman, Earnest Bullock, Wilmington

McDowell County Drs D M McIntosh, G S Kirby, Frank Wood

MEETING OF LOS ANGELES FELLOWS

Mr Murray Kornfeld, Executive Secretary of the College, announces that a meeting of the Los Angeles Fellows was held at the Los Angeles County Medical Society Building at 6 30 p m, Friday, February 23, 1940. The meeting, which included a dinner, was held under the direction of Dr E W Hayes, former President of the College and was addressed by Mr Murray Kornfeld, Executive Secretary of the College

FELLOW ELECTED TO OFFICE

Dr Forrest L Loveland of Topeka, Kansas, a Fellow of the College, was elected President of the National Conference of Medical Services for the year 1940-41, at a meeting of the organization held in Chicago on February 11, 1940. Dr Loveland had formerly served as secretary of the conference for the year, 1939-40

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DR JACKSON ADDRESSES
MEDICAL SOCIETY

Dr Chevalier Jackson of Philadelphia, Pennsylvania, a Fellow of the College, together with Dr Joseph Brennemann of Chicago, presented a symposium on epidemic tracheobronchitis before the Peoria City Medical Society on January 4, 1940

DR MYERS SPEAKS BEFORE
PUERTO RICAN SOCIETY

According to the *Boletin de la Asociacion Medica de Puerto Rico*, Dr Jay Arthur Myers, of Minneapolis, Minnesota, a Fellow of the College, spoke before the Annual Meeting of the Medical Association of Puerto Rico, which was held on December 8, 9 and 10, 1939

PUBLIC HEALTH MEETING ON
TUBERCULOSIS

The fourth annual meeting of the Rhode Island Public Health Association was held at Providence, R I, January 23, 1940, the topic of discussion being tuberculosis control Dr Herbert R Edwards, Director of the Tuberculosis Bureau, New York City, and Dr Alton S Pope of Boston, Director of the Division of Tuberculosis in the Massachusetts Health Department were among the speakers

TENNESSEE SETS UP TUBERCULOSIS
DIVISION

By authorization of the 1939 Tennessee Legislature, a separate division of tuberculosis has been organized within the Tennessee Department of Health The new unit will be devoted to study and research, case finding and hospitalization Dr Royden S Gass of Franklin, will be in charge of the division

FORLANINI INSTITUTE FELLOWSHIPS
POSTPONED

According to the *Bulletin* of the National Tuberculosis Association, the competition for the six Fellowships usually available at the Carlo Forlanini Institute in Rome has been indefinitely adjourned, due to present European conditions Fourteen applications had already been received from twelve countries, including the United States

TUBERCULOSIS HOSPITAL TO BE BUILT

A sixty-six bed tuberculosis hospital is to be built in connection with the Lincoln State School and Colony, Illinois, according to *Welfare*

DR. MARTIN L. STEVENS

1865—1940

Dr Martin L Stevens, of Asheville, North Carolina, a Fellow of The American College of Chest Physicians, died January 20th, at the age of seventy-five years He was born in Thomasville, Ohio, and graduated from the Baltimore Medical College in 1891, serving a year's internship at the Maryland General Hospital He came to Asheville in 1899 to join the staff at Winyah Sanatorium He then went to New York for post-graduate study and upon his return opened a private office, specializing in tuberculosis

He represented North Carolina in the House of Delegates of the American Medical Association for the last sixteen years of his life He was President of the North Carolina State Medical Society in 1930 and also served as a member of the State Board of Medical Examiners He was a charter member of The National Tuberculosis Association and the first President of the North Carolina Tuberculosis Association He was Chief of Staff of St Joseph's Hospital, Asheville, and consultant to state sanatoriums at both Southern Pines and Black Mountain

Dr Stevens was a Fellow of the American College of Physicians, a member of the American Climatological Association and of the Southern Medical Association He was a certified specialist of the American Board of Internal Medicine

He was of a quiet, retiring disposition, but always approachable and generous of his time and his money Three years ago he gave a dinner for the members of The Buncombe County Medical Society from his reimbursed travel allowance as delegate to the A.M.A The Asheville newspapers deplored his loss as a leading citizen, and the Lutheran Church, as it's leading pillar He was held in affectionate esteem by all who knew him

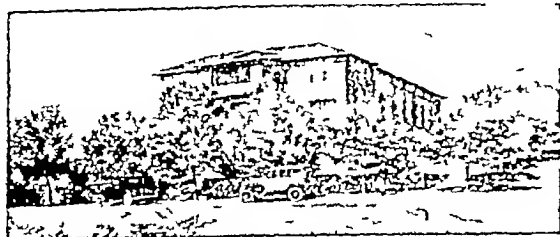
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Governor for North Carolina

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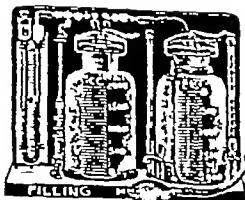
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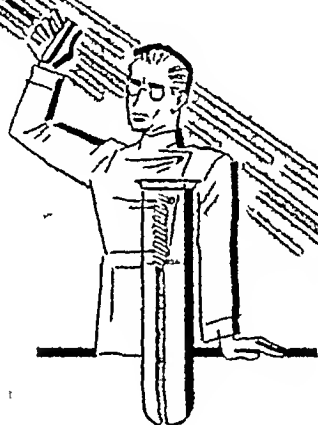
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Editorial Comment

As DISEASES OF THE CHEST enters its sixth year, the Editorial Board of the Journal desires to thank the contributors, subscribers, and advertisers for their loyal support during the past year

STARTING OUR SIXTH YEAR To Charles M Hendricks, the first editor of DISEASES OF THE CHEST, and to the others who have been responsible for the birth and development of this Journal, we extend our congratulations and we salute them on the completion of five years of work well done

To each and every one of you, the editor in chief and the members of the editorial staff of DISEASES OF THE CHEST extend their best wishes for a Very Happy New Year

DISEASES OF THE CHEST is unique, insofar as it is the first journal to be published on a particular specialty directed to the physician in the general practice of medicine. That the idea is a sound one, is borne out by our large and growing circulation. This policy of publishing short, practical articles on the subject of chest diseases, is meeting with favor, and we note with much pleasure that other specialties are contemplating the pub-

lishing of similar journals to further this idea in medicine

It is the purpose of the Editorial Board of DISEASES OF THE CHEST to continue the policy as established by the American College of Chest Physicians for this journal. Articles which are of practical value and are written in a style appealing to the physician in the general practice of medicine will be given preference in the columns of DISEASES OF THE CHEST. Our editorial pages will be an open forum for a frank discussion of subjects relating to chest diseases. Other items of current interest will appear from time to time in the pages of this journal.

The editors will be pleased at all times to receive comments from the readers of the journal and suggestions for the improvement of the material published in the journal will be welcomed. An invitation is hereby extended to any qualified physician to submit original manuscripts for publication in the journal.

We hope that 1940 will see a continuation of our journal's growth and we feel sure that with a continuation of our present support further strides in the early diagnosis and treatment of chest diseases will be made

F.W.B

EARLY DIAGNOSIS OF TUBERCULOSIS The past years have seen concerted efforts in a drive against our traditional foe—tuberculosis—and they are bearing fruit. We have noted with a gratifying satisfaction the steady decline in the mortality rate, year after year. Figures, only recently released by the Metropolitan Life Insurance Company, reveal a drop of about 10 per cent for the year 1938, as compared to the year 1937. Notwithstanding these glowing reports, however, the ultimate eradication of this dread disease is unfortunately, I fear, a small speck on a distant horizon. Notwithstanding the great strides we have made, the long way that we have come, tuberculosis is still in our midst and is still a menace of the first magnitude.

This grim reaper takes its deadly toll chiefly from young adult life, among the bread earners, and at the most productive period. It strikes at the very flower of mankind—youth. Therein lies the greater tragedy. It may be well to realize that tuberculosis remains today the leading cause of death in the age period, 20 to 40, and to realize that of all our young women who die between the ages of 15 and 25, over one half die from this disease.

Essential to any program of tuberculosis control, is early diagnosis, for this means the institution of the proper measures at the most effective time. Formerly, the early signs and symptoms were stressed, and the public was urged to become familiar with them, and seek medical advice at their first appearance. This is still important and it is not amiss to give a brief review of the cardinal ones. They are unexplained fatigue, lack of pep and endurance, a loss of weight, a cough that hangs on, a slight afternoon or evening fever, frequent chest colds, persistent or oft-repeated attacks of hoarseness, blood spitting and pleuritic chest pains. Any or all of these may be present in a given case.

We know today, that to insure an early diagnosis, it must be made before and not after symptoms appear. Only too often when symptoms develop, the disease has progressed apace. The diagnosis of tuberculosis can be made in the pre-symptom period by methods now at our command. It is done by periodic health examinations, the examination of all

known contacts of an open case of tuberculosis, and by large case finding surveys in the school, college, industrial and other groups. In this work, the tuberculin test, the x-ray and the sputum examination, are pre-eminent. With extremely few exceptions, a positive tuberculin test means that there is an infection in the system by the tuberculosis germ—the tubercle bacillus, and conversely, a negative test means that there is no such infection. The positive reactors are then x-rayed to determine whether or not clinical disease, or merely an implantation of the infection, exists. Of all the methods of investigation, the x-ray examination is the most important. We have the slogan that tuberculosis must be seen rather than heard. A reliance upon the physical examination alone is obsolete and fraught with error. The examination of the sputum for tubercle bacilli detects the open cases—the spreaders of infection.

I venture the assertion that if all open cases be segregated, or by treatment converted into closed ones, if every person be given the tuberculin test at proper intervals, and the positive reactors x-rayed periodically down through the years—tuberculosis could be wiped off the face of the earth.

We have, therefore, the means for the prevention and control of this disease, and there remains only to put them into operation. We hold before us the vision of humanity being freed of the shackles of this scourge, and in a large measure, it will be with the support and cooperation of the medical profession, that this will be brought about. C.H.H.

IMPORTANT ANNOUNCEMENT Due to the increase in the cost of paper stock and labor entering into the publishing of DISEASES OF THE CHEST, the Editorial Board of the Journal has found it necessary to increase the present subscription price of the Journal from \$2.00 to \$2.50 per year.

It has been the policy of the Editorial Board of DISEASES OF THE CHEST to produce a worthwhile publication at the lowest possible price, in keeping with production costs. At such time as conditions will permit, the subscription price will be adjusted to meet the production costs prevailing at that time.

F.W.B.



President's New Year Message



At this Season, the beginning of a new year, I wish to extend greetings and a few words of thanks to the Fellows of the American College of Chest Physicians for their untiring efforts in behalf of the College

A survey of the work accomplished since our annual meeting last May brings a glow of satisfaction in the knowledge that all have been working toward a mutual goal, resulting in splendid attainments

The College membership has been increased by the admission of seventy nine Fellows since the publication of our 1939 Pneumothorax Directory. A total of twenty five states report the existence of Tuberculosis Committees. I feel this number may be increased before the date of our next annual meeting. Many of the states report complete organization, or very nearly so. It is well known, of course, that the State of Pennsylvania was the first to report fulfillment of this work. I think it most timely to mention the one hundred per cent organization of the State of Indiana, of which Dr. James H. Stygall is Governor. It will be recalled that in the August 1939 issue of *DISEASES OF THE CHEST* he reported the organization of sixty three county societies, comprising a total of two hundred and twenty nine doctors as members of these County Committees for the Advancement of Tuberculosis Organization in Medicine. Certainly, Dr. Stygall, and the State of Indiana as a whole, is to be commended most highly for this splendid showing, and I am sure it is gratifying to them to know that their efforts have resulted in complete accomplishment of their aims.



In addition to the States in the Union, it is noteworthy that Norway is represented by the appointment of the eminent Dr. Carl Semb as Governor. Also, Governors have been appointed in India, The Philippine Islands, Hawaii, Australia, Canada, Cuba, Mexico, Ecuador and Puerto Rico.

In closing, I wish to express my fond hopes that every member of the College will make an earnest endeavor to attend our meeting in New York next June. One hundred and two physicians registered at our last meeting, representing approximately twenty per cent of our entire membership at that time. This year's program promises to surpass by far our previous one. Our Scientific Program, Entertainment and General Arrangements Committees are promising great things in store for us—so let's boost the percentage of attendance and come prepared for an interesting and enjoyable session.

RALPH C. MATSON, M.D., *President*
American College of Chest Physicians

Pulmonary Tuberculosis From a Public Health Standpoint

R H SUNDBERG, M.D., F.A.C.P. *
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Despite all efforts directed toward its control during the past ten years, tuberculosis still accounts for the greatest number of deaths between the ages of 15 and 45. It therefore merits an even more aggressive campaign for its eradication than is at present employed. Two all-important facts on which we can base our hopes of ultimate success in such a campaign stand out in our increasing knowledge of the disease: (1) tuberculosis is preventable and (2) it is curable.

When Koch discovered the tubercle bacillus in 1882 and proved that it was the cause of phthisis, he proved also, by producing it in animals and recovering the organism from the lesions, that it was a communicable disease. Since it is a communicable disease, it can be prevented by isolation of the active case, thereby preventing contact of others with the tubercle bacillus. Theoretically, if every case of pulmonary tuberculosis were isolated, there would cease to be any problem of tuberculosis control.

That the disease is curable, whether the lesion be in the parenchyma of the lung or in the bone, few will deny. The most important criterion of the curability is the size and extent of the lesion. Statistical studies in large sanatoria, including 5 and 10 year follow-up studies of discharged patients, reveal that up to 90 per cent of patients with minimal activity can be cured. The percentage of cures among patients with moderately advanced, or advanced lesions, under an equally adequate routine, falls with the extent and severity of the disease. The fact that well over 75 per cent of all cases admitted to most sanatoria fall into the classification of advanced disease shows clearly the need of diagnosis before the advanced stage is reached.

This early diagnosis has been difficult to obtain for two reasons, first, tuberculosis in any stage may be symptomless—and the pa-

tient, therefore, does not seek medical advice, and, second, physical diagnosis is not sufficiently accurate to pick up minimal or moderately advanced disease in a very high percentage of cases. At Trudeau Sanatorium where the results of roentgen and physical examinations were compared in a series of 600 cases, it was found that approximately 25 per cent of far advanced, 38 per cent of moderately advanced, and 52 per cent of minimal disease revealed no physical evidence of pulmonary tuberculosis. The fluoroscope and the x-rays have become vital parts of our armamentarium in the fight against this disease.

The most important part of the entire problem is the finding of the active cases. If they can be found before the lesions become open, the patients have a better chance for cure and will not become infectious to others. If the lesions are already open, steps can be taken for the isolation and care of these patients, so that they will cease to be a menace to others. The national, state, and local tuberculosis associations are agreed upon this particular phase of the problem and have pledged themselves to aid in finding the active and early cases.

Since 1925 the leaders in this work have advocated school surveys by means of the tuberculin test to find contact cases. Through them the active cases, which are serving as carriers of the disease, can be traced.

It is true that all cases of active disease among the students would be revealed by roentgenological chest examinations, but since not all contact cases have demonstrable calcified or fibroid lesions, many important clues as to the source of the contact would be lost, if x-rays alone were relied upon. The finding of active cases in the schools is important, but the chief objective of the survey lies in finding the potentially active case and through it the unknown active case which is serving as a source of infection in the home. This is probably an adult who thinks he

* Rees-Stealy Clinic

has "catarrh", asthma, or bronchitis. For this purpose, a follow-up campaign to the homes of the positive reactors is carried on by a trained social worker who obtains the complete family history and urges all members with suspicious symptoms to go to their family physician for roentgen examination of the chest. In this manner the probable source of the tuberculous infection can be found.

The accuracy of the tuberculin test has been questioned, but despite recent attacks by Lumson and others, authorities such as Long, Bush, Douglas, and Myers state that tuberculin testing surveys still furnish the best means of epidemiological study.

During the past eight years, tuberculin surveys, financed by the San Diego Tuberculosis Association, have been carried out in the San Diego high schools and State College. In 1932 permission for skin tests was given by parents in 1581 cases, in 1939, 3292 students were tested. Roentgen examinations of the chests of all the positive reactors were made and the families were interviewed.

Since 1932, from a total of 14,533 students tested, there have been 2904 positive reactors, slightly less than 20 per cent (19.9%). All nationalities were represented. Thirty-four clinically active cases of tuberculosis were found. Several hundred latent cases were classified as deserving of observation, because of massive calcification in the parenchyma or hilus or because of definite areas of fibrosis in the upper half of the lung. These patients, after their chest roentgenograms had been reviewed, were turned over to their family physicians with letters explaining the need of observation and regular roentgen examinations of the chest, as well as restriction of routine during the dangerous 'teen age. If these patients were unable to afford private care they were observed at the chest clinics of the San Diego Tuberculosis Association.

Of the 34 active cases, 3 were classified as far advanced, 8 as moderately advanced, and the remainder, 23, as minimal. All were given good prognoses by their various physicians and, up to the present time, only one case has terminated fatally so far as the writer knows. In the face of the high mortality of patients in the 'teen age group, who present themselves to their physicians with symptoms of active disease, this record speaks

for itself.

A study of the results of these surveys disclosed another interesting and important point. The incidence of clinical disease was highest among the positive reactors of the Negro, Mexican, and Oriental groups. It is true that the number of individuals tested in these groups was proportionately small, but the figures still suggest a greater incidence of disease among these contacts. It is our opinion, therefore, that particular emphasis should be placed upon tuberculin testing surveys in schools, where large numbers of Negroes, Mexicans and Orientals make up the attendance.

Many parents refuse to give their permission for the test and many individuals in the families of the reactors, who have symptoms, refuse to go to their physicians for examination. However, it is conceivable that some impression is made on even the most skeptical, so that if symptoms increase, there will be sufficient concern to stimulate investigation. More and more, parents are appreciating the value of the survey.

Aside from the public health importance of finding the early case, the economic importance to both the individual and the state is considerable. Individually, the patient with the early lesion stands a good chance of early cure and consequent economic independence. From the point of view of the state, the expense of caring for the case with the minimal lesion for a few months is negligible when compared with the expense involved in caring for the far advanced case over a period of years, or even for life.

Certain municipalities in the east have been very much impressed with this fact. As a result, the city of Detroit has appropriated sufficient funds for wide-spread tuberculin testing in the city, with roentgen examination of the chests of all the positive reactors. Thus far several hundred thousand individuals have been tested and hundreds of early cases found. Translated into money value, the saving to the state, which has been worked out in dollars and cents, has been considerable. Because of its success in Detroit, other cities in the midwest are planning similar surveys.

Careful postmortem studies have revealed that most adult individuals, up to 20 years

ago, had at some time or other been infected by the tubercle bacillus. These findings at post-mortem examination are decreasing. Yearly tuberculin testing surveys show a steady decline in the number of tuberculin positive reactors also.

We are gaining ground in the battle against

tuberculosis. Nevertheless, tuberculosis still takes first place as the cause of death during the most active years of life. We cannot escape this fact. Therefore, any aggressive means that shows promise of vanquishing or lessening the power of this common enemy, deserves our active support.

Demonstration of Cancer Cells in Pleural Fluids

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The study of section sediments of fluids is an invaluable procedure in the diagnosis of malignant effusions. While the method used is an old one, it had been generally overlooked, and it was only in the last few years that it has become deservedly a more common procedure. It is easily done, and the results so striking that it should be used routinely in the study of all fluids of suspected malignant origin.

Mandelbaum¹ in 1900 sectioned a purulent exudate and demonstrated actinomycosis. In 1917² he described the method used in studying the cytology of malignant effusions. This method forms the basis for all future work, though it has been modified by several to some advantage.

The original method is as follows. The fluid is placed in a large Erlenmeyer flask and allowed to stand over night in an ice box. The supernatant fluid is decanted and the sediment poured in a large centrifuge tube and centrifugated for at least twenty minutes at moderate speed. The supernatant fluid is again decanted and the sediment hardened with a solution of 10 per cent formaldehyd, or Zenker's fluid, for twentyfour hours. The fixed sediment is then treated as ordinary tissue by running through alcohols, embedding in paraffin, and staining with hematoxylin eosin. The final sediment is a little conical button, which is cut from the above down, so as to include all cellular elements.

A simple modification, as used by Foot,³

is the addition of glacial acetic acid to bring the acid percentage to two percent. This prevents coagulation, which often occurs in fluids and interferes with good sediments. The remaining procedure is the same as Mandelbaum's. Foot further suggests the use of Mason's trichome, a light green stain, because of its good staining of the nucleoli. However, any stain may be used.

The advantage of the section sediment method is that the cells in fluid may be studied in natural relationship to each other. A simple slide smear is usually unsatisfactory. A large amount of fluid should be used whenever possible. There are times when very few tumor cells are found. Therefore, the more fluid used, the greater chance there is of finding them. However, typical cancer cells may be found in just a few cc of pleural fluid. It is desirable to study several slides from repeated tapplings in doubtful cases.

A positive diagnosis of malignancy may be made with great accuracy. A negative diagnosis does not necessarily rule out its presence, as the effusion may not contain any tumor cells. One may expect to find cancer cells whenever cells are "shed" into the fluid (Fig 1).

The chief criteria of diagnosis of cancer cells are as follows. The most definitely diagnostic finding is the presence of fragments of tissue with characteristic arrangement of cells with glandular or papillary formation about a stroma (Fig 2).

The next most characteristic finding is

the presence of groups of deeply stained cells which stand out conspicuously among the various types of other cells present and give the section a mottled appearance, especially noticable under low power magnification (Fig 3)

The mistakes and difficulties in diagnosis lie in those cases in which we have single tumor cells, or small groups of cells (Fig 4) In many long standing non-malignant effusions there are large mesothelial cells present which may readily be confused with tumor cells (Fig 5) These cells may also show irregularities in size, they may be multinucleated or may be hyperchromatic, though not usually to the extent of malignant cells

Another factor in differential diagnosis is the presence of mitotic figures (Fig 6) Zemansky,⁴ who made one of the earliest studies of section sediments, states that in a large series of fluids studied, it was always pathognomonic of malignancy Karp,⁵ and also Foot state that mesothelial cells may show mitosis frequently enough to cause confusion We have but rarely observed mitosis in proven non-malignant fluids Certainly, the presence of numerous mitotic figures is highly suggestive

Vacuolation and "signet ring" forms are also significant, but not pathognomonic of malignant cells as they may occur in other effusions

The relationship of the nucleolus to the nucleus, by actual measurement, is of some importance Quensil,⁶ states that in malignant-cells this ratio is high, ranging from .20 to .40 While in non-malignant cells it is below .20 The value of this method has also been brought out by Foot It involves the measurement of characteristic or suspicious cells with an ocular micrometer The presence of large nucleoli in cells is always significant

In forty cases of pleural effusions, due to malignancy, section sediments showed carcinoma cells in twenty-nine A negative diagnosis is presumptive evidence against malignancy, but does not, of course, rule it out Some of the reasons for a negative diagnosis follow There may be no cancer cells in the fluid, as in those effusions which

are due to obstruction of a venous return A tumor may be tightly encapsulated and, therefore, not "shed" cells This is apt to occur in sarcoma Only one out of three sarcoma effusions showed recognizable sarcoma cells (Fig 7) The cells may disintegrate if the fluid is not quickly and properly handled, though they may remain in good preservation even after standing about long enough to have bacterial contaminations The metastatic cases of pleural effusions, such as those arising from the breast or ovary, show 100 per cent positive for cancer cells The missed cases are more apt to be due to primary lung tumors

Certain of the non-malignant cases of effusions simulate cells seen in the malignant types This is especially true of long standing transudates in which clumps of mesothelial cells strongly resemble malignant cells These non-malignant forms may show multinucleated types, hyperchromaticity, and, occasionally, even mitotic figures As yet there are no clear cut criteria for their positive identification Repeated examination of many fluids, with careful corroboration of post mortem and biopsy material, will unquestionably help clear up the problem

Conclusions

The section sediments of pleural fluids are of tremendous value in determining the etiology of the effusion In malignant effusions one can expect to find cancer cells in at least two-thirds of the cases Further criteria are necessary for the determination of the isolated cell

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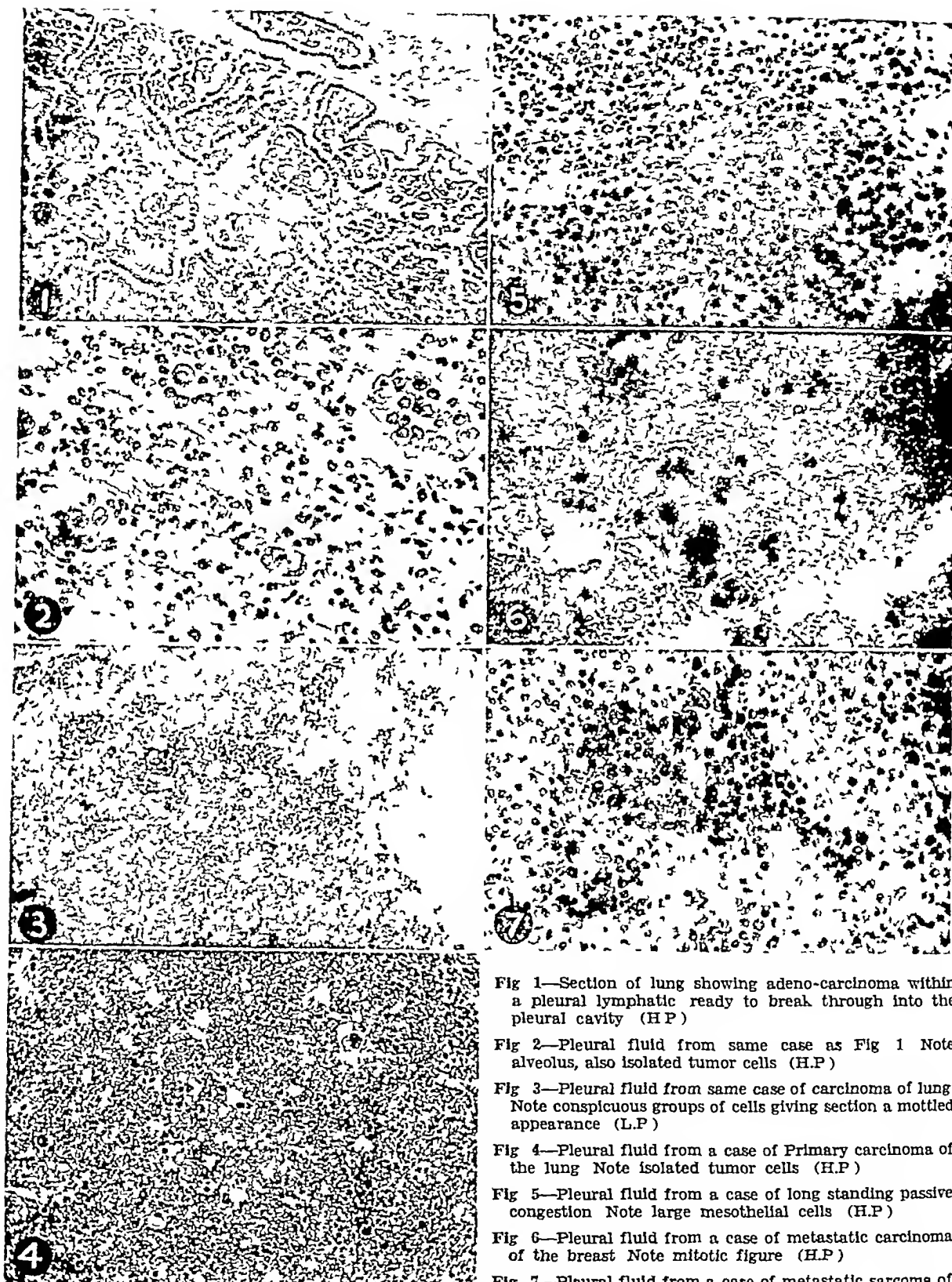


Fig 1—Section of lung showing adeno-carcinoma within a pleural lymphatic ready to break through into the pleural cavity (H.P)

Fig 2—Pleural fluid from same case as Fig 1 Note alveolus, also isolated tumor cells (H.P)

Fig 3—Pleural fluid from same case of carcinoma of lung Note conspicuous groups of cells giving section a mottled appearance (L.P)

Fig 4—Pleural fluid from a case of Primary carcinoma of the lung Note isolated tumor cells (H.P)

Fig 5—Pleural fluid from a case of long standing passive congestion Note large mesothelial cells (H.P)

Fig 6—Pleural fluid from a case of metastatic carcinoma of the breast Note mitotic figure (H.P)

Fig 7—Pleural fluid from a case of metastatic sarcoma of the leg (H.P)

A Note on the Early Diagnosis of Pulmonary Tuberculosis

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The incidence of pulmonary tuberculosis is very high in practically every country on earth, but especially in India. In 1933, Megaw estimated that there were probably 2 million cases of tuberculosis in this country, which has a population of approximately 350 millions. And even such an estimate was probably much too low.

The scanty statistics regarding tuberculosis deaths that are available in India show that there were nearly 51,000 deaths from tuberculosis of the lungs in 1934. These figures clearly indicate the high morbidity and mortality rates of the disease here, and it is my opinion that these rates are still increasing. That the morbidity and mortality rates of the disease must be lowered, and as quickly as possible, is obvious. And it seems to me that the first step in this direction should be to secure early and accurate diagnosis, for that not only alters materially the prognosis of the actual cases, but allows preventive measures to be adapted as far as dissemination of tuberculosis from these cases is concerned.

Detection of pulmonary tuberculosis at the preclinical stage, though an ideal thing, is being made at the present time only in a limited number of cases. The number of such detections can, however, be increased by routine x-ray examination of all contact cases, especially of those who are in the age period of maximum incidence.

Once the disease has reached the clinical stage, the responsible task of early diagnosis rests mostly with the general practitioner—for the patient first comes to him and not to the specialist. The general man should see to it that every suspicious case is thoroughly investigated, that a history is carefully taken, that a bedside examination is made, with an extra attention to the chest, and that special investigations are then undertaken, where necessary.

The onset of tuberculosis is usually insi-

dious and various indeed may be the symptoms at this stage. Important amongst them are failure in general health without obvious reasons, easy fatigueability, simple feverishness or actual rise of temperature towards the evening, burning sensation in the hands and feet, dry cough, vague pains in the chest, progressive loss of weight, dyspeptic and neurasthenic symptoms and, in some cases, hemoptysis. Symptoms pointing to the chest, naturally draw attention to that part of the body, but the symptoms referable to other systems are to be especially borne in mind. A positive family history, that is a history of contact with actual cases and a history of pleurisy in the past, should double the suspicion of the clinician.

Clinically suggestive signs of early disease are phthisical habitus, increased pulse rate during resting conditions, low blood pressure, localized deficiency of movement in the chest, dubious impairment of percussion note, weak air entry, jerky breath sound or harsh breathing and fine crepitations. At times these adventitious sounds are made obvious only after a cough. Persistent crepitations when heard over the apices of the lungs are particularly suggestive of tuberculosis. While speaking of these clinical signs it is necessary to stress their limitations. Even the expert may fail to detect any abnormality on clinical examination in certain cases of pretty far advanced pulmonary tuberculosis. This statement is especially applicable to some cases with exudative and fibrotic lesions.

Though various special examinations for the detection of this disease are available, undoubtedly the two most important are sputum examination and radiography. Demonstration of tubercle bacilli in the sputum constitutes the surest evidence of the disease, but unfortunately, the sputum is not often available in early cases and even when available may not show the bacilli. However, if sputum is available it should be examined carefully and, if necessary, repeatedly.

The value of the x-ray in the diagnosis of

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tuberculosis cannot be overestimated X-rays not only give a presumptive evidence of the lesion and, incidentally, serve as a valuable guide to treatment In assessing the relative values of sputum examination and radiography it may be stated that x-rays help in the early detection of large numbers of cases only in the cities and towns, but that outside of these places, where the x-rays are not always available, sputum examination still remains practically the only method of clinching the diagnosis in a suspected case Very valuable though x-ray examination is, it also has its limitations and may fail to reveal any abnormality in many early cases which are highly suspicious on clinical grounds In such cases the x-ray examination should be repeated at short intervals

A positive tuberculin test is a definite proof

of tuberculous infection However, this might easily be an infection of early life and, therefore, not necessarily an indication of active tuberculous disease A negative test is very valuable, as it rules out the possibility of tuberculosis in 90 per cent, or more, of the cases An increased blood sedimentation rate indicates activity of lesion and is, therefore, more important for prognosis than for diagnosis, especially because an increased rate may be found in other diseases too The same is probably true of Arneth and other similar counts

In conclusion, it should be emphatically mentioned that at the present time the guiding principle of every practitioner should be to consider every suspected case tuberculous until proven otherwise by repeated sputum and x-ray examinations

The Modern Treatment of Pulmonary Tuberculosis^{*}

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Every case of pulmonary tuberculosis should be treated as soon as the diagnosis is made To be completely successful, and to guard against later relapse, treatment should be continued until all symptoms have subsided, serial roentgenograms show healing, and the sputum remains negative for tubercle bacilli

In the medical treatment of pulmonary tuberculosis, chief reliance must be placed on rest In addition to this, perfect hygienic surroundings, fresh air, good, nutritious foods, lack of worry, and, above all, the cooperation of the patient to regulate his life are essential

The ideal site of treatment for a tuberculous patient is, of course, in the sanatorium Effective isolation can be brought about only by removing the open case from his home Also the sanatorium provides the patient with the necessary instructions and habits

for taking care of himself after discharge

In some cases, medical treatment alone often suffices to bring about a good result, but in the majority of cases, collapse therapy of one kind or another is essential At the present time, 63 per cent of all our patients in the sanatorium are under some form of collapse therapy

In the last decade, surgery has come to play a prominent role in the treatment of pulmonary tuberculosis And the whole question of surgery in pulmonary tuberculosis may be summed up in the words "collapse therapy" All surgical procedures consist in collapsing the diseased lung, the simplest method for collapsing the lung being artificial pneumothorax Atmospheric air is injected between the parietal and visceral layers of the pleura, the lung drops away from the chest wall and becomes markedly reduced in size, and its movements are restricted

The lung may be kept collapsed by repeating the injections of air over a long period of time In some cases of bilateral disease,

^{*} I am indebted to John A. Foley, M.D., Chief-of-Staff, and John J. Ahern, M.D., Resident Medical Officer, for valuable information received in the preparation of this paper

this procedure is performed on both sides (bilateral pneumothorax)

During the year 1938, we had 13,100 pneumothorax refills, whereas in 1934, only 4,647 refills were made, showing a marked increase in this form of collapse therapy

Adhesions may prevent good collapse of the diseased lung. They are often distributed over the diseased parts of the lung where collapse is most important

All are agreed as to the advisability of converting an unsatisfactory collapse into a satisfactory one by severing the offending adhesions by means of intrapleural pneumonolysis. Two methods of cutting adhesions are available, namely, the galvanocautery, which we employ, or the electro-surgical method

During the past year (1939), over 100 pneumonolyses have been performed in comparison to 7 which were done back in 1934

Operations on the phrenic nerve are sometimes performed in cases of basal tuberculosis. The purpose of the operation is to paralyze the corresponding half of the diaphragm, thus giving additional rest to the diseased lung. One may perform either permanent or temporary interruption. The former is known as phrenicectomy, and the latter, phrenicotomy or phreniclasia

In permanent interruption, the nerve is cut and the distal end grasped and twisted from its diaphragmatic bed. In the case of simple phrenicotomy, the nerve is merely cut across, and in phreniclasia, the nerve is crushed. The operation that we favor and perform is that of crushing about one inch of the nerve. This procedure will paralyze the corresponding diaphragm for three to seven months

At the present, phrenic interruption is rarely used as an independent procedure and is usually supplemented by other types of collapse

Oleothonax consists in the use of massive quantities of an antiseptic oil in the pleural cavity for therapeutic purposes. We employ oleothonax therapy under the following conditions

(a) For the treatment of tuberculous empyema following pneumothorax—Disinfection Oleothonax

(b) To re-establish collapse in cases where air refills have failed to maintain proper col-

lapse—Compression Oleothonax

(c) To prevent re-expansion of the lung when pneumothorax cannot be maintained by air refills—Inhibition Oleothonax

We have been able to obtain fairly good results by the use of 5 per cent gomenol in paraffin oil

Our experience has been too recent to allow us to determine how important a place extrapleural pneumothorax will take among the methods of collapse therapy in pulmonary tuberculosis. We do not advise this procedure as a substitute for intrapleural pneumothorax or thoracoplasty, but as an additional procedure indicated in cases in which the former had failed or the latter was contraindicated

Extrapleural pneumothorax is a method of collapsing pulmonary lesions by the removal of a portion of either the third or fourth rib and the injection of air into the space between the endothoracic fascia and the parietal pleura in contradistinction to intrapleural pneumothorax, where air is injected between the parietal and visceral layers of the pleura

There is no doubt that patients will submit more readily to an extrapleural pneumothorax, where a portion of one rib is removed, than to a thoracoplasty, where a number of ribs must be removed

Within the past two years, 1938-1939, we have performed 50 such operations with very favorable results. There is no doubt that it will aid many cases where other types of collapse therapy are impossible and contraindicated, and is certainly deserving of more universal trial

Thoracoplasty consists in removing some or all of the ribs so as to permit a collapse of the thoracic wall with a consequent collapse of the underlying diseased lung. It is rather difficult to enumerate the exact indications for thoracoplasty, the final available hope for the tuberculous patient. We usually recommend this procedure in suitable cases, where other types of collapse therapy have been unsuccessful. Cases submitted to thoracoplasty should be carefully selected by the phthisiologist and the thoracic surgeon

With the advent of extrapleural pneumothorax, we find that we are not forced to perform as many thoracoplasties as in the past. In thoracoplasties, we remove the whole

rib from its articulation with the spine to the junction with the cartilage. Only three ribs are removed at each stage. We remove the upper three ribs at the first stage, the periosteum being touched with 10 per cent formalin so as to prevent too rapid bone formation.

After three to four weeks, the patient is submitted to the second stage. If a third stage is required, it is performed after an interval of three more weeks.

It is paramount to remember that rest is still of the greatest importance in the treatment of pulmonary tuberculosis. Collapse therapy of whatever nature is not to be considered a substitute for bodily rest, but a supplementary and complementary aid to insure final success.

Despite the fact that 65 per cent of the cases admitted to the sanatorium have far advanced disease, in many of whom collapse is limited, we have found that an intensive

collapse therapy program has definitely helped to reduce the morbidity and mortality of pulmonary tuberculosis.

COLLAPSE THERAPY AT THE BOSTON SANATORIUM—1934-1938

TYPE OF COLLAPSE

1934	1935	1936	1937	1938
<i>Pneumothorax Refills</i>				
4,647	5,771	7,615	12,700	13,100
<i>Pneumonolysis</i>				
7	38	58	84	91
<i>Phrenic Operations</i>				
51	23	13	22	29
<i>Oleothorax Treatments</i>				
61	87	102	114	271
<i>Extrapleural Pneumothorax</i>				
0	0	0	0	26
<i>Thoracoplasty</i>				
19	45	27	19	14

Tuberculosis in Athletes

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Tuberculosis usually has been considered a disease of the weak, the malnourished and the underprivileged. Indeed, many have taught that the strong, healthy, "athletic" body was the best of all safeguards against tuberculosis. In critical analysis, just how true are these generally accepted and common beliefs? Is the athlete any more secure from the ravages of tuberculosis than the average person? We all know specific examples of famous and once prominent athletes who have died of tuberculosis. We might mention Christy Mathewson, the great pitcher, Tom Hinckley, of Yale football fame, and Joe Gans, George Dixon and the original Jack Dempsey, all famous fighters.

In this paper we desire to reopen the subject for further investigation in the hope that further study may be carried on in high schools and colleges. Thousands of our young men are engaged in strenuous athletic competition, with its inevitable grind of the long training period and the even more exhausting playing conditions of the modern game. This

is especially true of basketball—since the elimination of the center jump last year. The spectators must be entertained and, therefore, the game must be made faster and faster.

Since all of these boys are amateurs and are supposedly playing for the love of the game and the glorification of the school, is it not the simple duty of the school authorities to do everything necessary to insure that none of these athletes are victims of early and symptomless tuberculosis? Tuberculosis authorities the world over are now in practical agreement that a tuberculous infiltration may exist for years without producing any symptoms whatsoever. Indeed, no less authority than the late Lawrason Brown, of Saranac Lake, often has stated that tuberculosis is almost never contracted after the age of twenty-five. This simply means that in our high schools and colleges of today we have about 60 per cent of our tomorrow's deaths from tuberculosis.

It generally is conceded by all experienced

tuberculosis physicians that the tuberculin test and x-ray, or the routine x-ray alone, have almost entirely replaced the stethoscope in the diagnosis of early tuberculosis. More and more we hear the phrase, "Tuberculosis should be seen, not heard." However, we must consider the fact that only 16.2 per cent of the Texas State Sanatorium¹ admissions last year were minimal cases as evidence that we are still *hearing* tuberculosis in our patients and not *seeing* it. Why are these standard procedures not used as a regular and routine part of the physical examination of athletes in our high schools and colleges? Is it because school officials and team physicians do not recognize the problem of tuberculosis in our young adults, or is there still some inherent belief in the invincibility of the athlete?

In an attempt to learn what the leading schools and universities of the United States were doing to find tuberculosis among their students, we sent a form letter to the directors of student health in forty-four fairly representative universities and colleges. This questionnaire contained only two inquiries, namely:

(1) Do you, as a part of the regular physical examination required for athletes, include the tuberculin test and x-ray of positive reactors?

(2) Do you include the tuberculin test as a regular part of the physical examination of all students entering the university?

We received answers from 33, or 75 per cent, of those to whom questionnaires were sent, and 21, or 63 per cent, of those answering, have some definite plan in operation to find early cases of tuberculosis in all their students, or expect to begin one this fall.

It is interesting to note the regional distribution of colleges and universities with case-finding programs in actual operation (Tables 1 and 2). It is interesting to note that in the Southwest Conference we find not one university with a definite case-finding program. Certainly, we cannot expect to find tuberculosis in our young adults unless we look for it, using all the modern diagnostic methods known. Rice Institute, however, plans to use the tuberculin test and x-ray as a routine part of the physical examination of athletes this fall and is to be congratulated on this forward step. We shall watch with interest for the results.

We should like to review briefly some results of outstanding case-finding programs as reported by various schools in the United States. Are these programs actually finding early cases of unsuspected tuberculosis, or are they merely interesting research projects?

The seventh annual report of the Tuberculosis Committee of the American Student Health Association² has a number of interesting and extremely important observations, one of which we would like to quote:

"The figures for the active cases alone reveal that among a student mass, but partially covered by tuberculosis testing, four times as much active tuberculosis was diagnosed per thousand enrollment as was found in a large group receiving neither routine testing nor routine roentgenograms, while in a group provided with excellent facilities for routine x-rays of all concerned, there was discovered seven times as much active disease per thousand as among the less fortunate untested, unradiographed body. This would seem to be a decisive answer to the question asked by some correspondents as to whether a modern case-finding program is worth the bother and expense. It may also provide food for thought for those who report, 'no cases of tuberculosis have been found at this school for many years,' or 'We do these tests and order an x-ray for any student *having symptoms*'."

The University of Michigan³ routinely x-rays the chests of all new students entering the school, with an active case incidence of 57 per cent in men and 56 per cent in women resulting as an average for the past four years. The number of active cases found has been less each year of the program, which undoubtedly reflects the progress of tuberculosis control in the entire state, rather than just at the university. Even with one of the best tuberculosis control programs in the United States, examiners still are able to find one case of active tuberculosis in every 250 to 300 apparently healthy, normal students.

The University of Pittsburgh⁴ tuberculin tested 1,618 male students in 1938 and found 17 active cases of tuberculosis, an incidence of 1.05 per cent. Second tests were done on 388 negative reactors with the second strength solution and an additional six active cases were found. In addition, 49 healed cases of adult type tuberculosis were found in the

entire group It is self-evident that healed tuberculosis cases should not be allowed to participate in strenuous athletics From these figures, we are forced to conclude that at the University of Pittsburgh, four in every hundred male students would be incapacitated for athletic competition by reason of active or healed tuberculosis

At the University of Washington ⁵ approximately 60 per cent of those tested reacted to the tuberculin, with somewhat less than 1 per cent active cases of tuberculosis as an end result

Yale University ⁶ tuberculin tested 1,544 students during the school year 1937-1938 and found 16, or 1.03 per cent, cases of active pulmonary disease Three cases were moderately advanced and required immediate active treatment, while the rest required only advisory treatment

The University of Pennsylvania ⁷ is the only school that we were able to find which has completed a special study of tuberculosis among athletes During the past four years, approximately 560 chest x-rays have been taken of varsity squad members, and five cases of pulmonary tuberculosis have been discovered, an incidence of slightly less than 1 per cent While this is not a large group, the incidence among athletes seems to be approximately that of the average students

In the University of Wisconsin, ⁸ an average of ten cases of tuberculosis per year was found from 1919 until 1933 In the school year 1933-1934, a rather intensive tuberculin testing program was started and 43 cases were reported, an increase of 430 per cent over the ten-year average Of these 43 cases, 17, as compared with a yearly average of 4, were advised to leave school and take active treatment Roentgenographical examinations indicated that approximately 5 per cent of the positive reactors, or 1.5 per cent, of all tuberculin tested students had adult type tuberculous infiltration Approximately 1 per cent of the positive reactors and 2 per cent of those tested had lesions requiring immediate active treatment in a sanatorium or bed rest at home

In the school year 1937-1938, all new students entering Princeton University ⁹ were routinely x-rayed as a part of their entrance physical examination In all, 658 students were x-rayed, with only one active adult case

of tuberculosis being discovered This extremely low incidence probably may be accounted for by considering the economic status of families from which the majority of Princeton students are selected

During the school year 1935-1936, the University of Oregon ¹⁰ made 1,091 tuberculin tests with 457 positive reactors X-ray examination disclosed 7 minimal cases of pulmonary tuberculosis and one moderately advanced case with positive sputum In addition, 4 apparently arrested cases were found which, we presume, were not permitted to participate in athletics

We trust you have noted the frequency with which the figure 1 per cent appears among the incidence figures for the various schools While, obviously, it is impossible to predict the total number of active cases of tuberculosis which might be found in any one school, it seems reasonable to conclude that from 5 to 10 active cases of tuberculosis per 1,000 students could be found among apparently healthy college students in our Texas institutions

It is estimated that about 20 per cent of our Texas school children are sensitized to tuberculo-protein How many of these actually have destructive adult type tuberculosis? This, of course, depends upon many factors the age group represented, the race, and also, to some extent at least, the economic status Myers ¹¹ states that while we must examine from two to four thousand grade school children to find one case of adult tuberculosis, we need to examine only five to eight hundred high school students

Rathbun ¹² reports that from the years 1923 to 1934, a total of 9,336 high school students over the age of fifteen in Chautauqua county, New York, were tuberculin tested and x-rayed, with an incidence of active adult cases of 7 per cent and an additional 4 per cent of suspicious infiltrations During the first five years of the study, the incidence was 1 per cent, or one active case for every 100 students examined, without reference to symptoms or history of exposure During the second five-year period, the incidence dropped to 38 per cent During the same period, the death rate dropped from 69 per hundred thousand, to 25 per hundred thousand—a decrease of 64 per cent Rathbun

further states that many of the outstanding cases were big, strapping fellows who were well known high school athletes. He believes that the extra strain, both physical and mental, of competitive athletics was of prime importance in the development of active disease in these boys.

Edwards¹³ tested several thousand children in the public schools of New Haven, Connecticut, and a total of 6,393 x-rays were taken. In the age group, six to ten years, not one case of adult type tuberculosis was discovered. In the eleven to fifteen year age group, he found only one case by x-raying 3,879 children. However, when he examined the high school age group, ages fifteen or over, he found six cases in 1,461 x-rays. This would indicate one case per five hundred students examined.

Chadwick¹⁴ in Massachusetts presented approximately the same findings with only one case per 3,200 grade school children examined, and one case for every 460 high school students.

In a study of causes of physical disqualification for athletic competition in Indiana, Patty and Van Horn¹⁵ reported on the results of some 12,000 physical examinations of high school athletes. They report that tuberculosis ranked fifth among the causes for rejection, and that 2.97 per cent of the approximately three hundred boys rejected as unfit to enter high school athletics had tuberculosis. The importance of these figures is minimized by the fact that 65 per cent of the schools reported no boys rejected. All these figures can possibly mean is that some schools examined for possible tuberculosis among their athletes, while others did not and consequently reported no cases.

In the Tyler Public Schools, the tuberculin test is as much a part of the regular physical examination of athletes as the stethoscopic examination of the heart. This past year, we have tested 52 high school athletes, and 11 were sensitive to the 1/1000 (1 mg) of old tuberculin. The negative reactors were then tested with a stronger solution containing 1 mg per 1 cc, and 4 additional reactors were discovered. X-ray films were made of the

chests of all those reacting to either dilution and thus far we have found one boy* with a suggestive infiltration in the left apex. He has absolutely no symptoms, and his sedimentation rate is 6 mm in one hour. However, he is a known contact of a boy who is at the state sanatorium at the present time and who probably had positive sputum all last summer.

We should like to present a few cases to illustrate our belief that tubercle bacilli have very little respect for athletic ability.

(Cases 1, 2, and 3 courtesy of Dr J V Sherwood, South Dakota Sanatorium)

In December, 1936, a sixteen year old high school boy developed a persistent cold with cough and some fever. In January, 1937, he had a pulmonary hemorrhage, and in March of the same year, he was finally x-rayed and found to have generalized tuberculosis with cavity formation. He was admitted to the state sanatorium in April, but the disease was far advanced and he died the following December, just one year after the first symptoms were noted.

At the same time, his high school basketball coach, who had been a rather famous college basketball player, began to lose some weight and developed a slight cough. However, he was not diagnosed as having tuberculosis until the following July. He was admitted to the sanatorium immediately with a positive sputum and both apices involved.

The third case in this series is that of a young seventeen year old girl from the same high school, who developed signs of weakness, fatigue, and pleural effusion, with high fever and signs of acute illness for about two weeks. She was admitted to the sanatorium in February, 1938.

These three cases represent one of the greatest tragedies of preventive medicine. There is little doubt that the coach was the source of the infections in the two high school students. If he had been properly examined with all available medical knowledge while he was in college, his tuberculosis most certainly would have been discovered. We think that you all will agree that one death and two prolonged sanatorium cases is too high a price to pay for simple neglect on the part of school authorities.

(Case No 4 courtesy of Dr J A Myers, Minneapolis, Minnesota)

* This case had apparently cleared by Sept 1 1939, and his chest x-ray was reported negative for active tuberculosis by a competent radiologist.

The next case is that of a personal friend of mine, a fraternity brother. He came from a small mining town in northern Minnesota where he had been a star high school athlete and fullback on the Junior College eleven and where he took his premedic work. He entered the University of Minnesota Medical school in the fall of 1930, and nothing abnormal was found at his regular entrance physical examination (They were not doing routine tuberculin tests at that time). The next spring he began to have rather marked symptoms and presented himself to the health service for examination. Pneumothorax was started immediately, and for a time it looked as if his lesion was coming under control nicely. However, a year later, films showed the development of an enormous cavity with adhesions preventing collapse of the cavity. In 1935, I visited him at Glen Lake Sanatorium, near Minneapolis, where he had returned for his fourth and fifth major collapse operations. He had a phrenic evulsion, four stages of thoracoplasty, and two gauze packs before he finally became persistently negative. He still is having pulmonary hemorrhages from a pronounced bronchiectasis, and now they are beginning to consider a lobectomy as his best chance for a permanent cure.

(Case No 5, courtesy Dr E A Meyerding, St Paul, Minnesota)

This boy played high school football the entire fall, but in January he had several hemorrhages and was admitted to a hospital. He had tubercle bacilli in his sputum. This boy had been examined for football the fall before, but the examination did not include the tuberculin test. Undoubtedly, his season of football materially reduced his chances of permanent recovery. In fact, had he been diagnosed before the beginning of football season, he might not have required sanatorium treatment at all.

(Case No 6, courtesy Dr E A Meyerding, St Paul, Minnesota)

The next case is that of a young man who was in one of the smaller colleges in Minnesota. In this particular year, the college was champion of the middle west in its class, due in most part to the blocking halfback who was such a splendid physical specimen. After

football season, he started to play basketball, but couldn't quite keep up. He was sent to a physician and has been in a sanatorium ever since and has had several thoracoplasties. He has been given up several times, but manages to hang on year after year. Undoubtedly, if this boy had been tested prior to the football season, his tuberculosis would have been discovered then, and he would, in all probability, be a healthy, useful citizen today.

(Case No 7, courtesy Dr Charles Ianne, Santa Clara County Hospital, San Jose, Calif)

This boy was an outstanding player on one of the nation's best football teams of 1936. He played safety so dangerously against two of the best ends in the United States in the first Sugar Bowl game at New Orleans on January 1, 1937 that L S U consistently kicked out of bounds rather than take the chance of trying to stop him. Yet, within 26 days after that game, he was in bed with a high fever and a tentative diagnosis of pneumonia. However, sputum tests were positive for tubercle bacilli, and a definite cavity was present. He has had a bilateral pneumothorax with intrapleural pneumolysis on the right side. At the present time, he is studying law at Santa Clara University. We should like to quote a part of his last letter to us, dated March 17, 1939.

"I played my last game on the first of January, 1937, in New Orleans against L S U. In retrospect, I can see now that I was very ill at that time and I did not know what was the matter with me. I went to bed 26 days later and did not even put my feet on the floor for over six months."

This boy actually played college football all fall with active tuberculosis, which would most certainly have been discovered had he been tuberculin tested and x-rayed. He even coughed blood several times while playing, but apparently coaches and trainers thought that it would be impossible for such an outstanding athlete to have tuberculosis. Permit us to quote again from a letter we received from this boy on January 21, 1939.

"I know from experience and what I have read that a case like mine might have been avoided if proper examinations would have been made at the time when they would have done the most good."

(Case No 8, courtesy Dr Walter Rathbun, Cassadaga, New York)

This last case is an excellent illustration of the educational value of tuberculin testing programs in high school. This boy played football and basketball in high school and then went on to college where he started to play football. One day during a practice session, he coughed up a little blood. He immediately consulted the college physician, who told him that he probably had bronchitis. He insisted upon an x-ray examination, whose value he had learned in high school. As a result of this lad's high school knowledge of tuberculosis, he was able to demand and get a proper physical examination, which resulted in his complete recovery under sanatorium treatment. He might have been permitted to continue playing football until all chances for recovery had been lost.

These cases represent only a very few of the hundreds of ex-athletes who have been treated for tuberculosis in the United States. There are no figures available to determine the total number of athletes in the United States, who actually have played football and basketball while suffering from early tuberculosis. However, let us be conservative and agree with Myers, Chadwick, and Edwards that there is at least one case of tuberculosis to every five hundred high school students. The rate is undoubtedly higher among college athletes, but let us again be conservative and estimate one case of tuberculosis to every two hundred students.

In Texas, we have approximately 25,000 boys playing class A, B, and C high school football, another 15,000 playing high school basketball, and at least another 10,000 engaged in all college competitive athletics. These figures do not include junior high athletics, where the risk is less on account of the age level, or the undertermined number of girls playing basketball. If we assume that one in five hundred boys actually has adult type tuberculosis, then we had fifty cases of unsuspected, symptomless tuberculosis on the Texas high school football field last fall.

Assuming one case in every 200 college-age athletes, we had another fifty engaged in competitive athletics in the Texas universities

and colleges. It obviously is impossible to find these cases without using the x-ray. Ideally, every high school or college athlete should have a chest x-ray at the beginning of the playing season. However, x-rays are expensive, and since we do not expect to find more than 20 per cent of high school students and 50 per cent of college students who are sensitive to tuberculo-protein, we can reasonably dispense with the x-ray except for positive tuberculin reactors.

There is no evidence to indicate that a boy with a positive tuberculin test and a normal chest x-ray should be prohibited from engaging in competitive athletics. However, the undoubted stress and strain of athletic endeavor leads us to believe that a little more than routine examination should be given those boys with known positive tuberculin reactions. These tuberculin positive athletes should have chest plates taken at the beginning and preferably again at the end of each playing season. The director of student health at the University of Pennsylvania refuses to accept responsibility for tuberculosis developing in an athlete unless such a procedure is carried out.

Meyerding,¹⁶ Lees and Rathbun all believe that the excessive physical strain of athletic competition, plus the physical changes of adolescence, definitely lower a boy's resistance to the invasion of tubercle bacilli. Certainly we would all agree that a boy with minimal or healed adult type tuberculosis should not be subjected to the physical wear and tear of athletic competition which might result in permanent invalidism or death.

The control of tuberculosis is not at all difficult, and certainly it is not spectacular. We do not wish to leave the impression that athletes are peculiarly susceptible to tuberculosis, or that the athlete is the only tuberculosis problem among our high school and college students. However, we do contend that any boy participating in high school or college athletics has the moral right to a complete physical examination which includes scientific tests and x-rays to exclude the possibility of symptomless tuberculosis. This is a definite obligation of school authorities which, at the present time, is being sadly neglected.

We have no more right to allow a boy or girl to play football or basketball without examining for tuberculosis with the tuberculin test and x-ray than we have to allow the same youngsters to play these games without listening to the heart with the stethoscope

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Table I

SCHOOLS WITH CASE FINDING PROGRAMS TUBERCULOSIS

School	Tb Test (Athletes)	Tb Test	(All Students)
<i>Southeast</i>			
Georgia Tech	No	No	
Auburn	No	Yes (Begin 1939)	
Vanderbilt	No (Fluoroscope)	Yes (Begin 1939)	Yes
Tennessee	No	Yes (Begin 1939)	(85 per cent)
Mississippi	Yes	Yes (85 per cent)	
Mississippi State	Yes	Yes	
Kentucky	Yes	Yes	
Alabama)			
Florida)			
Georgia)	DID NOT ANSWER QUESTIONNAIRE		
Sewanee)			
<i>North Central</i>			
Illinois	No	No	
Chicago	No	Fluoroscope all	
Michigan	No	X-ray all	
Minnesota	No	Yes	Yes
Purdue	Yes	Yes	(87 per cent)
Wisconsin	Yes	Yes (87 per cent)	(87 per cent)
Notre Dame	Yes	Yes	
Missouri	Yes	Yes	
Indiana)			
Iowa)			
Northwestern)	DID NOT ANSWER QUESTIONNAIRE		
Ohio)			

DISEASES OF THE CHEST

Table II

SCHOOLS WITH CASE FINDING PROGRAMS
TUBERCULOSIS

School	Tb Test (Athletes)	Tb Test	(All Students)
<i>East and Northeast</i>			
Pennsylvania	Yes	Yes	Yes
Pittsburgh	Yes	Yes	(66 per cent)
Yale	Yes	Yes	
Princeton	Yes	Yes	
Harvard	No	No	
Carnegie Tech	No	No	
<i>Southwest</i>			
Rice	Yes (Begin 1939)	No	
A & M College	No	No	
S M U	No	No	(100 per cent)
T C U	No	No	
Texas	No	No	
Baylor)	DID NOT ANSWER QUESTIONNAIRE		
Arkansas)			
<i>Pacific</i>			
Oregon State	No	Yes	Yes
Oregon	No	Yes	(75 per cent)
California	Yes	Yes	
Washington	No	Yes	
Stanford	No	No	
Southern California	No	No	
California at L A	No	No	
Washington State	DID NOT ANSWER QUESTIONNAIRE		

NOTICE

At the annual meeting of the Board of Regents of the American College of Chest Physicians held at the Chase Hotel St Louis Missouri on May 13th 1939 a motion was duly proposed and passed to raise the annual dues of the fellows of the College from \$5 00 per annum to \$10 00 per annum, same to be effective January 1 1940

The above advance in dues was made necessary because of the need for supporting the vast amount of work being carried on by the College within organized medicine

FRANK WALTON BURGE M D
Chairman Board of Regents

Organization News

COMMITTEE ON TUBERCULOSIS ORGANIZATION REPORTS

Dr Benjamin Goldberg, Chicago, Illinois, First Vice-President of the American College of Chest Physicians and Chairman of the Committee for the Advancement of Tuberculosis Organization in Medicine submits the following report

Since the reporting of Tuberculosis Committees in twenty five states as published in the December, 1939, issue of the journal, the following additional state medical societies have reported the establishing of Tuberculosis Committees as standing or as special committees of their state medical societies

Wisconsin A A Pleyte, M.D., Milwaukee, *Chairman*, W T Clark, M.D., Janesville, and L O Simenstad, M.D., Osceola

New Jersey Abraham E Jaffin, M D, Jersey City, *Chairman*, Samuel B English, M.D., Glen Gardner, *Vice-Chairman*, Norman W Burritt, M.D., Summit, Leo B Drake, M.D., Franklin, Clyde M Fish, M.D., Pleasantville, Henry H Kessler, M.D., Newark, Marcus W Newcomb, M D, Browns Mills, Harold S Hatch, M.D., Morristown, John E Runnells, M.D., Scotch Plains, H Burton Walker, M.D., Vineland, Joseph R Morrow, M.D., Ridgewood, Henry B Kessler, M.D., Newark, Roy Griffith M.D., Glenridge, and George J Young, M.D., Morristown

Illinois Robert H Hayes, M.D., Chicago, *Chairman*, Herman H Cole, M.D., Springfield, and Frank J Smejkal, M.D., Chicago

PENNSYLVANIA TUBERCULOSIS COMMITTEE

The Tuberculosis Committee of the Pennsylvania State Medical Society for the year of 1940 is comprised of the following members C Howard Marcy, M.D., Pittsburgh, *Chairman*, John H Bising, M.D., Reading, Royal H McCutcheon, M.D., Bethlehem, S J Hawley, M.D., Danville, C R Phillips M. D., Harrisburg, Ross K Childerhose, M.D., Harrisburg, J Paul Frantz, M.D., Clearfield, Victor M Leffingwell, M D, Sharon, Elmer Higberger, M.D., Greensburg, O S Kough, M.D., Uniontown, Chas A Heiken, M.D., Philadelphia, and Chas H Miner, M.D., Wilke-Barre

VIRGINIA TUBERCULOSIS COMMITTEE REPORTS

Dr E C Harper, Richmond, Virginia, Director, Tuberculosis Out-Patient Service, State Department of Health, and Chairman of the Tuberculosis Committee of the State Medical Society re-

ports that the Tuberculosis Committee was re-appointed this year and that the other two members of the committee are Dr Dean B Cole, Richmond and Dr Frank B Stafford, Charlottesville The development of the Tuberculosis Out-Patient Service and the establishment of forty seven pneumothorax clinics have been the chief objectives of the committee Dr Harper reports that 3,734 chest punctures were given at the clinics on 355 patients without any accidents or casualties X-rays were done on 5825 individuals

The following recommendations were made by the committee

(1) The use of paper films for mass examination of industrial plants, schools, and other groups The advisability of checking all positive cases with stereoscopic celluloid films before a final diagnosis is made

(2) Tuberculin tests in the public schools in Virginia should not be made unless arrangements are immediately available to x-ray all of the positive reactors Clinical tuberculosis is so rare among the rank and file of the elementary schools, both white and colored, in the state, that it would probably be more advisable to spend the time and money with the high school and college groups

(3) There is a definite need for more beds for negro patients The increased capacity at the state negro sanatorium will only take care of half the present waiting list

(4) The committee recommends that all public school teachers have an annual x-ray examination of their chests

NORTH CAROLINA TUBERCULOSIS COMMITTEE REPORTS

Dr Karl Schaffie, Asheville, North Carolina, Governor of the College for North Carolina and a member of the Committee for Tuberculosis Organization in Medicine reports that a campaign has been started to organize a Tuberculosis Committee in every County Medical Society of North Carolina Letters have been directed to the presidents of each of the County Medical Societies requesting that such committees be appointed Dr S M Bittenger, Black Mountain, North Carolina is the Chairman of the State Tuberculosis Committee He reports that one of the outstanding accomplishments of the state committee has been the establishing of a Tuberculosis Seminar which is now a permanent postgraduate course held in the summer of each year at Asheville Dr Karl Schaffie was the chairman for the Seminar last year and it was attended by fifteen physicians

GEORGIA TUBERCULOSIS COMMITTEE REPORTS

Dr Champ H Holmes, Atlanta, Georgia, Chairman of the Georgia State Tuberculosis Committee and Past President of the American College of Chest Physicians submits a copy of the report made by the State Tuberculosis Committee before the House of Delegates of the Georgia State Medical Association at their annual session at Atlanta. Every member of the committee had submitted a report on local activities which is included in the complete report. We publish herewith abstracts of those reports.

Dr H C Atkinson, Macon Gives a full statistical report of the activities in Macon and Bibb County. During the past year 2339 patients were seen in the clinic and 3053 visits were made to tuberculous patients. They have in his county a very active pneumothorax clinic. Tuberculosis deaths in his county show a slight decline from 60 in 1937 to 57 in 1938. Dr Atkinson raises the important question of the segregation in institutions for the far advanced cases. He states that it is not being done in his community.

Dr William C Cook, Columbus A new County Tuberculosis Sanatorium has been opened during the past year. Clinics for adults and children are held once a week. The follow-up work by the county tuberculosis nurses is very efficient. Dr Cook feels that more talks on tuberculosis should be made to the public, and has personally been active in this regard.

Dr Robert V Martin, Savannah There is a tuberculosis committee of the local medical society. Much interest has been aroused in, and considerable activity directed toward, securing one of the planned state sanatoria in Savannah. A preventorium for children is now being operated. A detailed report of the Chatham-Savannah Tuberculosis Association gives an index to the fine work of this body.

Dr R C McGahee, Augusta Reports excellent work being done by the Augusta-Richmond County Tuberculosis Association, and by the department of tuberculosis of the local medical college. 800 students have been tuberculin tested. With the aid of the Junior Chamber of Commerce, the early diagnosis campaign is now being successfully launched.

Dr T H Moss, Rome One hundred and thirty cases of tuberculosis are under supervision and are visited by the county nurses. Through facilities of the Junior Service League, pneumothorax is being given to a limited number. There are no facilities for hospital care, and those cases needing it are sent to Alto.

Dr John A Simpson, Athens Submits a detailed report for Clarke County. 20 clinics were held in 1938 and 226 individuals were x-rayed. There were 1508 field visits by the Public Health Nurses. At the present time 252 cases of contacts, suspects and positives are being kept under active supervision.

Dr Ernest F Wahl, Thomasville With some help from the county health physician, Dr Wahl is taking care of most of the tuberculosis needs in his section. He is quite active in giving pneumothorax refills and this includes returned cases from Alto.

Dr Cleveland D Whelchel, Gainesville Reports an intense interest in tuberculosis by the members of the Hall County Medical Society. They have a very active tuberculosis committee. Extensive skin-testing has been done under the guidance of Drs J L Meeds, E L Ward and Dr W R Garner. All positive reactors are x-rayed.

Dr H C Schenck, Atlanta In Dr Schenck, who is the head of the Tuberculosis Division of the Georgia Health Department, we have a committee member who is most valuable in correlating and integrating the whole of the tuberculosis activities in the state.

In speaking for Fulton County, I am very happy in presuming at an early date, with the cooperation of our President, Dr Ed Greene, the creation of a tuberculosis committee. The Atlanta Tuberculosis Association and the Battle Hill Sanatorium are continuing to do very creditable work. Under the leadership of Dr Irwin Willingham we are off to a splendid start in launching our early diagnosis campaign. It is with regret, in spite of our concerted efforts, that tuberculosis was not given a more prominent place on the program of the annual state meeting this year. It will certainly be no fault of ours that it is not done at the next and subsequent meetings.

Respectfully submitted,

Champ H Holmes, M D

GOVERNOR FOR IOWA REPORTS

Dr J Carl Painter, Dubuque, Iowa, Governor of the American College of Chest Physicians for Iowa appeared before the meeting of the Council of the Iowa State Medical Society, held on November 8th, and presented a request for the establishing of a Tuberculosis Committee for the State Medical Society. This is in keeping with the program advanced by the American College of Chest Physicians and a committee was appointed by the Council to investigate the matter and report to the Council at its next meeting.

(continued on page 26)

KANSAS TUBERCULOSIS COMMITTEE REPORTS

Dr Henry N Tihen, Wichita, Kansas, Chairman of the Tuberculosis Committee of the Kansas State Medical Association reports that the chief objective of his committee is to coordinate the work of all of the agencies in the state interested in tuberculosis work. They have made excellent progress along these lines during the past few years and a number of counties have carried on active tuberculosis work under the direction of the local county societies.

TUBERCULOSIS COMMITTEE FOR THE DISTRICT OF COLUMBIA

Dr Wm D Tewksbury, Washington, D C, Governor of the College for the District of Columbia reports that Dr J Winthrop Peabody has been appointed Chairman of the Tuberculosis Committee for the District of Columbia Medical Society. Dr Tewksbury has served as the chairman of this committee three times in past years. Dr Peabody, is the Second Vice-President of the American College of Chest Physicians.

MISSOURI TUBERCULOSIS COMMITTEE REPORTS

Dr E E Glenn, Springfield, Missouri, Chairman of the Tuberculosis Committee of the Missouri State Medical Association and a member of the Committee for the Advancement of Organization in Medicine reports that the committee was instrumental in having a symposium on tuberculosis published in the November issue of the Journal of the Missouri State Medical Association. The following is a list of the subjects and the names of the authors:

The Prevention of Pulmonary Tuberculosis, Herbert L Mantz, M.D., Kansas City, Missouri.

Symptoms Signs and Diagnosis of Pulmonary Tuberculosis, J A Stocker M.D., Mount Vernon, Missouri.

Differential Diagnosis of Chronic Pulmonary Diseases, Dan M Myers, M.D., St Louis, Missouri.

Sanitarium Treatment of Tuberculosis, George D Kettelkamp, M.D. Koch, Missouri.

Home Treatment of Pulmonary Tuberculosis, William M Kinney, M.D., Joplin, Missouri.

Surgical Procedures in the Treatment of Pulmonary Tuberculosis, J L Mudd, M.D., St Louis, Missouri.

Missouri Tuberculosis Association, Donald E Pratt, Executive Secretary, St Louis, Missouri.

NEW JERSEY TUBERCULOSIS COMMITTEE REPORTS

Dr Marcus M Newcomb, Browns Mills, New Jersey, Governor of the College for New Jersey reports that a bill was enacted by the State of New Jersey this year which will require mantoux testing in the schools for children, and health examinations and x-ray pictures of all employees of Boards of Education. Dr Newcomb as a mem-

ber of the New Jersey State Legislature has worked for the passing of these bills for nine years. During that time he was successful in having the bill passed in the Assembly five times but each time it was killed in the Senate.

Editorial Comment This report by Dr Newcomb is most gratifying and the Committee on Tuberculosis Organization in Medicine extends their congratulations to Dr Newcomb upon his excellent work in behalf of this legislation.

NEW MEXICO TUBERCULOSIS COMMITTEE REPORTS

Dr LeRoy S Peters, Albuquerque, New Mexico and Governor of the College for New Mexico reports that the Tuberculosis Committee of the New Mexico State Medical Association has sponsored the tuberculin testing of all school children in Bernalillo County (City of Albuquerque) and students at the University of New Mexico. X-rays are taken of all positive reactors which are sent to the Maytag Research Laboratories for reading. It is compulsory for tuberculin testing of all freshmen at the University of New Mexico.

FLORIDA HEALTH NOTES

Dr M Jay Flipse, Miami, Florida, Governor of the American College of Chest Physicians for Florida, published a paper in the December issue of the Florida Health Notes, monthly publication of the Florida State Board of Health. The article was entitled, "Tuberculosis Program in Florida has Shifted from School Surveys to Adults." The entire issue was turned over to articles on tuberculosis activities in Florida and in addition to Dr Flipse, articles were contributed by Dr A J Logie, Director of Tuberculosis, State Board of Health, Dr R D Thompson, Superintendent of the State Tuberculosis Sanatorium, and Mrs May Pinchon, Executive Secretary of the Florida Tuberculosis and Health Association.

PRESIDENT ELECT OF COLLEGE HONORED

Dr John H Peck, Oakdale, Iowa, President Elect of the American College of Chest Physicians was the guest of honor at a dinner given by the Johnson County Medical Society of Iowa on November 1st. A paper was presented by Dr Henry C Sweany, Director of Research of the Chicago Municipal Sanitarium entitled, "The Sequelae of Pulmonary Tuberculosis."

DR FROST ACCEPTS POSITION

Dr R H Frost, a Fellow of the American College of Chest Physicians has been appointed as Superintendent of the G B Cooley Sanatorium at Monroe, Louisiana. Dr Frost was formerly superintendent of the Bucna Vista Sanatorium, Wabasha, Minnesota.

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Dr Ralph C Matson, President of the American College of Chest Physicians, announces the appointment of the following committees

COMMITTEE ON NOMINATIONS

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SANATORIUM COMMITTEE

Harry Warren, M D, Chairman, San Francisco, California, Alexius M Foister, M D, Vice-Chairman Colorado Springs, Colorado, Orville E Egbert, M D, El Paso, Texas, Chas M Hendricks, M.D, El Paso, Texas, Louis Mark, M.D, Columbus, Ohio, William Devitt, M D, Allenwood, Pennsylvania, B A Shepard, M D, Kalamazoo, Michigan, Harry Golembe, M.D, Liberty, New York, C H Gallenthien, M D, Valmora, New Mexico, John E Nelson, M D, Seattle, Washington

Dr Walter E Vest of Huntington, West Virginia, Governor of the American College of Chest Physicians for West Virginia, was appointed as the President of the Southern Medical Association. In his talk before the annual meeting, Dr

Vest advocated that a Secretary of Health be set up in the Cabinet of the President of the United States, and that all of the public health activities be entered under the direction of the Secretary of Health

Dues in the American College of Chest Physicians will be due on January 1st, 1940. The College has no paid executives and in order to facilitate the functioning of the organization, the Secretary-Treasurer requests that the members please mail their dues promptly

S W Schaefer, M D, a Fellow of the American College of Chest Physicians, has moved from Colorado Springs, Colorado, to 178 East Seventieth Street, New York City, N Y

Arnold Shamaskin, M.D, a Fellow of the American College of Chest Physicians, has moved from 15 Central Park, West, to 667 Madison Avenue, New York City, N Y

DR MINNIG RESIGNS FROM THE AMERICAN ACADEMY OF TUBERCULOSIS PHYSICIANS

Dr Arnold Minnig, Denver, Colorado, a Fellow and charter member of the American College of Chest Physicians, desires to notify his many friends through the columns of DISEASES OF THE CHEST that he has tendered his resignation as a member and as the secretary-treasurer of the American Academy of Tuberculosis Physicians. Dr Minnig states:

"That after observing the activities of the various organizations in the specialty of chest diseases, he feels that the American College of Chest Physicians is best constituted to serve the interests of the chest specialists in his country"

Editor's Note Dr Arnold Minnig has, no doubt, been in closer contact with the inner workings of the American Academy of Tuberculosis Physicians than any other one individual and we are publishing the above statement without reservation at Dr Minnig's request

NOTICE

Through an error the name of Mrs. Theodore B Sachs, Executive Secretary of the Tuberculosis Institute of Cook County of Chicago was omitted as the author of the article on the History of the Tuberculosis Institute of Cook County and Chicago which was published in the October and November issues of DISEASES OF THE CHEST

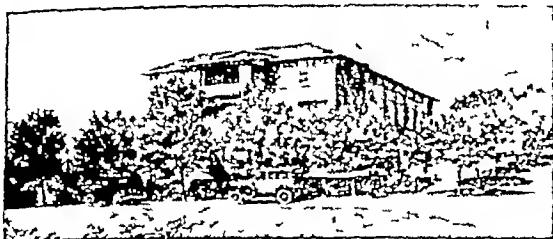
Editor

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Dr Ralph C Matson, President of the American College of Chest Physicians, announces that a Membership Committee has been appointed, whose duty it will be to stimulate membership in the College among physicians who have the necessary qualifications for Fellowship. This committee will work in close cooperation with the Governors of the College and with the members of the Board of Regents.

The committee consists of the following members

Arnold Minnig, M.D., Chairman, Denver, Colorado, John F. Allen, M.D., Omaha, Nebraska, E. W. Hayes, M.D., Monrovia, California, Jerome R. Head, M.D., Chicago, Illinois, George Ornstein, M.D., New York City, New York, Robert Homan, M.D., El Paso, Texas, E. J. O'Brien, M.D., Detroit, Michigan, Oscar S. Proctor, M.D., Seattle, Washington.



THE 1940 PNEUMOTHORAX DIRECTORY

Listing the Fellows of the American College of Chest Physicians who are qualified and equipped to administer artificial pneumothorax, will be available after the 15th of January. Special designations for physicians who are thoracic surgeons, bronchoscopists, laryngologists, and who specialize in other allied fields of chest diseases will be made in the Directory.

The 1940 Directory will again show a marked increase in the Fellowship of the College, and in the listings over that of the previous directories issued by the American College of Chest Physicians. There will also be a number of listings of physicians who are Fellows of the College and who are resident in countries other than the United States.

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